NYASALAND PROTECTORATE.

ANNUAL

MEDICAL & SANITARY

REPORT

For the year ending 31st December, 1933.

PRICE 4s.

Annual Medical & Sanitary Report

for the year ended 31st December, 1933.

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MEDICAL AND SANITARY SERVICES,

ZOMBA,

NYASALAND.

13th July, 1934.

Sir,

I have the honour to submit for the information of His Excellency the Governor and for transmission to the Right Honourable the Secretary of State for the Colonies, the Medical Report on the Health and Sanitary conditions of Nyasaland for the year 1933, together with the Returns, etc., appended thereto.

I have the honour to be,

Sir,

Your obedient servant,

A. D. J. B. Williams,

Director of Medical Services.

The Hon. the Chief Secretary to the Government,

Zomba.

CONTENTS.

SECTION I. ADMINISTRATION.

A. STAFF.

The staff sanctioned for the year 1933 was :—

(a) European.

Director of Medical and Sanitary Services	Bacteriologist (appointment deferred)
Senior Health Officer	Matron
Senior Medical Officer	10 Nursing Sisters
Medical Entomologist	2 Sanitary Superintendents
14 Medical Officers	Clerk and Medical Storekeeper.

During the year the staff was brought up to full establishment with the exception of the post of Bacteriologist which was not filled.

(b) Asiatic.

10 Sub-Assistant Surgeons (provision for nine and one temporary relief).

(c) African.

10 Clerks (a reduction of 2 from 1932).	40 Vaccinators (a reduction of 4 from 1932)
18 Hospital Assistants (5 posts held in abeyance)	246 Hospital and Dispensary Attendants and Servants
182 Dispensers and Probationers	18 Medical Store Assistants, Packers, etc.
15 Sanitary Inspectors and Probationers (a reduction of 3 from 1932)	5 Messengers and Watchmen

A varying number of Sanitary Labourers, averaging 240.

Principal appointments, promotions, changes, etc., made during the year :—

Appointments :—

	Date
Dr. A. D. J. B. Williams. O.B.E. to be Director of Medical and Sanitary Services	5. 9. 33.
Dr. R. A. Newsom, Medical Officer, from	7. 12. 33.
Miss S. Johnson, Nursing Sister, from	30. 3. 33.
Mr. V. T. Smithyman, Junior Clerk (Temporary) from	23. 10. 33.

Acting Appointments :—

Dr. H. H. B. Follit, Senior Health Officer to be acting Director of Medical and Sanitary Services, from	17. 5. 33.	to end of year.
Miss N. M. Cremen, M.B.E., Nursing Sister to be acting Matron from	17. 5. 33.	to end of year.

Transfers :—

Dr. T. W. Stephens, Medical Officer, to the Gold Coast	9. 8. 33.
Dr. D. P. Turner, ,, ,, from Zanzibar	8. 8. 33.
Dr. C. H. Howat, ,, ,, from Cyprus	23. 10. 33.
Miss. D. C. Howard, Nursing Sister, to Gold Coast	27. 3. 33.
Mr. S. S. Kokari, Sub-Assistant Surgeon, from I. M. S.	1. 1. 33.

Retirement :—

Dr. F. E. Whitehead, O.B.E. Director of Medical and Sanitary Services from	4. 9. 33.

Termination of Appointments :—

Subadar Natha Singh retired	6. 2. 33.
Jemadar Jawand Singh reverted to I. M. S. D.	17. 3. 33.

Death :—

Mr. E. B. Mothello, African Clerk, died at Zomba	17. 9. 33.

B. LIST OF ORDINANCES, ETC., ENACTED DURING 1933 AFFECTING PUBLIC HEALH.

GOVERNMENT NOTICE No. 43 OF 1933.

New bye laws made by the Blantyre and Limbe Town Councils.

GOVERNMENT NOTICE No. 44 OF 1933.

New bye-laws made by the Limbe Town Council. The Limbe (European) Cemetery bye-laws 1933.

GOVERNMENT NOTICE No. 50 OF 1933.

New bye-laws made by the Port Herald Town Council.

C. FINANCIAL.

REVENUE AND EXPENDITURE.

The total expenditure for 1933 was £45,397 10s. 6d. an increase of £173 5s. 2d. on the expenditure for 1932. The total expenditure represents approximately one eighth part of the total revenue of the Protectorate.

The total revenue of the Department was £1,599 4 4

	£	s.	d.
Hospital fees	829	10	9
Sale of drugs, etc.	(*) 729	13	7
	£1,599	4	4

* In addition 4,900 bottles of 100 tablets of bihydrochloride of quinine and 194 packets of quinine sulphate were sold to the public from unallocated stores and realised the sum of £980 16s. 2d. The sales of quinine show a decrease in comparison with those of last year, when 5,594 bottles and 336 packets were sold at a cost of £1,023 2s. 0d.

Approved Expenditure—1933 .... £46,684

Actual Expenditure, 1933:—

	£	s.	d.
MEDICAL:			
Personal emoluments	25,272	14	3
Other charges	13,711	15	11
SANITATION:			
Personal emoluments	4,556	10	9
Other Charges	1,856	9	7
Total expenditure ...	£45,397	10	6

COLONIAL DEVELOPMENT FUND.

The total expenditure on health services for the year was £8,861 2s. 4d. Of this amount the completion and the equipment of medical buildings accounted for £6,600 approx., £2,220 was expended on sanitary works undertaken by the Blantyre and Limbe Town Councils and the remainder was expended on the improvement of village water supplies and on incidental expenses.

SECTION II.—PUBLIC HEALTH.

A. GENERAL REMARKS.

Although the effects of the world wide depression are still being felt, it is gratifying to note that not only no reduction in medical staff took place but that the establishment of Medical Officers was filled during the year, an increase of personnel of one on the number employed in 1932.

The retirement from the service of the Director of Medical and Sanitary Services, Dr. F. E. Whitehead, O.B.E., is recorded with regret. This is a loss to the Protectorate which it will be hard to replace.

Dr. H. H. B. Follit carried out the duties of the Director for seven and half months of the year; his services are gratefully acknowledged.

Medical Assistance to Missions and other public bodies.

It has been the custom for many years for grants to be made to certain Missions in order to assist them in the maintenance and upkeep of leper treatment centres, such activities being almost solely undertaken by the religious societies—the financial assistance so afforded during the year amounted to £980. As Government does not maintain a native hospital in the Blantyre-Limbe district a contribution of £325 a year is made to the Mission hospital at Blantyre (Church of Scotland), in order to ensure that native and Asiatic employees of Government and members of the general native population may obtain free hospital treatment when recommended such treatment by a Government Medical Officer.

Registered employers of labour are also assisted by being permitted to purchase from the Medical Department, at landed cost price, drugs and dressings, provided they maintain a small dispensary.

Missions maintaining hospitals also share to some extent in this privilege.

The value of the sales to the public in this respect amounted to £770 for the year.

Free issues are made to Missions, where leper settlements are established, of drugs used in the treatment of leprosy and such drugs as Hynocreol, Moogrol, Oil of Chaulmoogra, Potassium Iodide, etc., are supplied. The value of such supplies amounted during the year to £90 approx.

Free issues of drugs for the treatment of hookworm are also made and during the year the value of the amount issued was £50.

Returns for the year.

The number of patients, both in and out-patients, treated during the year is compared with the numbers treated for previous years in the following table :—

	1930	1931	1932	1933
Europeans —				
In-patients ...	146	190	189	178
Out-patients ...	1,164	1,367	1,079	1,217
Total ...	1,310	1,557	1,268	1,395
Africans and others				
In-patients ...	3,958	5,160	6,325	7,322
Out-patients ...	225,361	267,457	308,862	353,344
Total ...	229,319	272,617	315,187	360,666

The annual increase in the number of African in-patients has been satisfactorily maintained and may be attributed to the increasing confidence displayed by the native in hospital treatment.

The number of out-patients treated includes the figures returned by the rural dispensaries—these figures are probably unreliable owing to the very scanty supervision to which the native dispensers have been subjected.

The incidence of the diseases treated at Government hospitals during the year is shown below :—

Incidence of Diseases according to Groups.

		Hospitals		Rural Dispensaries.	
1.	Epidemic, Endemic and Infectious Diseases	10,351		15,527	
2.	General Diseases	2,148		6,542	
3.	Affections of Nervous System	10,637		23,468	
	Eyes		7,510		18,050
	Ears		2,496		4,804
4.	Diseases of Circulatory System	369		210	
5.	Diseases of Respiratory System	14,273		28,614	
6.	Diseases of Digestive System	28,923		41,937	
	Ankylostomiasis		9,719		4,350
	Constipation		8,095		17,984
7.	Diseases of Genito-urinary System	2,822		2,667	
8.	Puerperal state	128		21	
9.	Affections of Skin and Cellular Tissue	23,849		56,421	
	Ulcers		10,816		31,006
	Scabies		6,839		13,889
10.	Diseases of Bones and Organs of Locomotion ...	3,035		3,118	
11.	Malformation	4		—	
12.	Diseases of Early Infancy	63		—	
13.	Affections of Old Age	18		—	
14.	Affections produced by External Causes	16,006		51,361	
15.	Ill-defined Diseases	2,378		7,454	
	Total ...	115,004		238,340	

The following diagarams I—IV show the incidence of the epidemic, endemic and infectious diseases, the proportion of these diseases treated at hospitals and the proportion of the in-patient deaths amongst the diseases in Group I and in all groups of diseases.

Diagram I.

Showing the proportion of infectious, systematic and other diseases treated at the Government hospitals. (Excluding rural dispensaries.)

Total incidence 115,004.

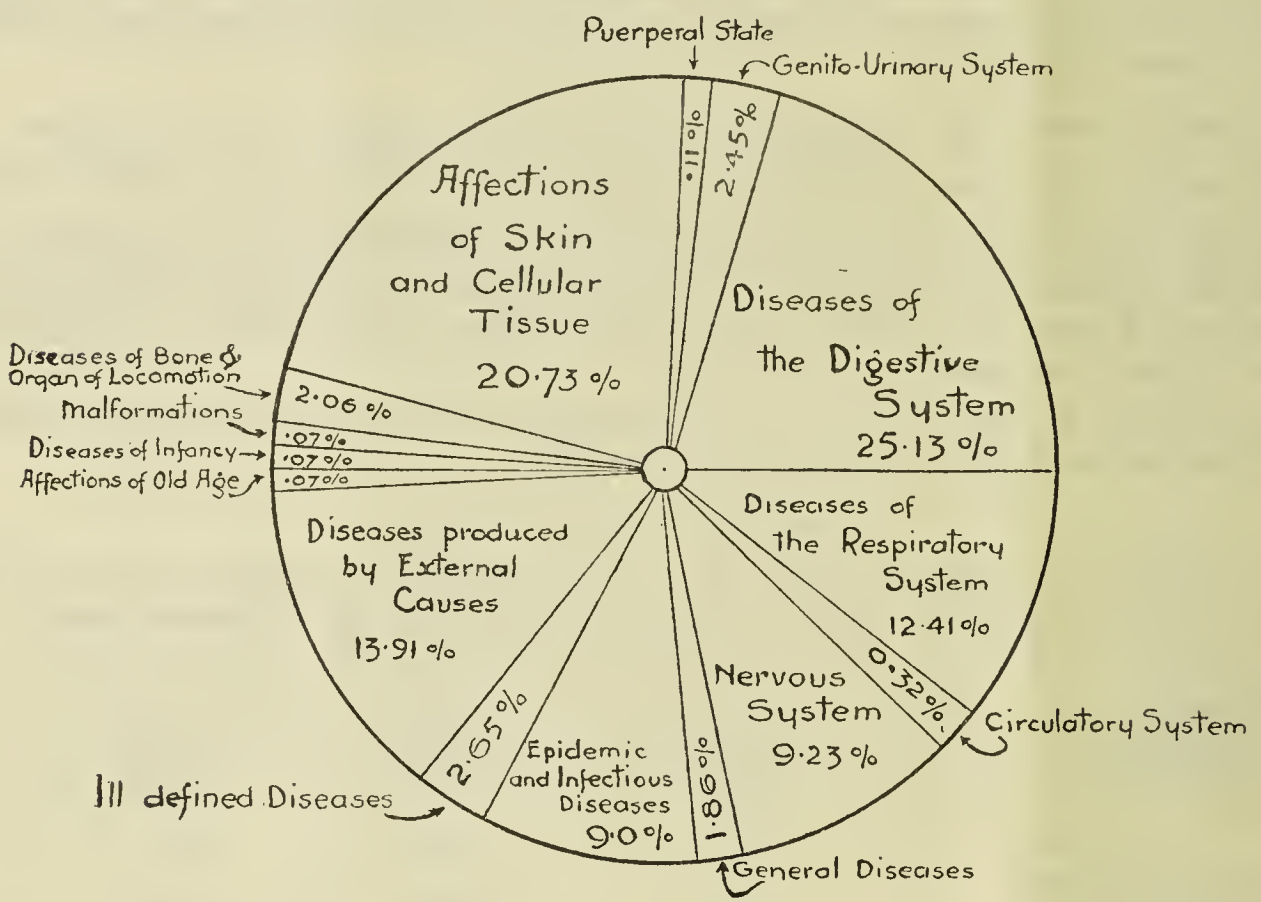


Diagram II.

Showing the proportion of in-patient deaths amongst the groups of diseases.

Total in-patient deaths 216 = 2.88 per cent. of all in-patients.

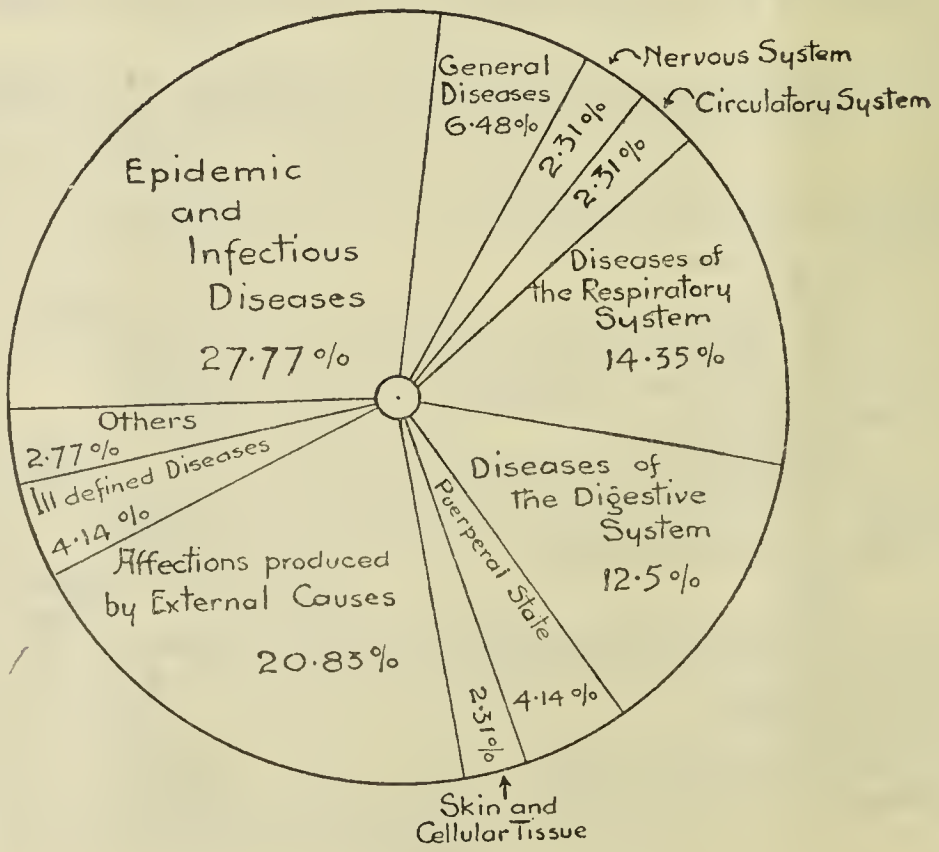
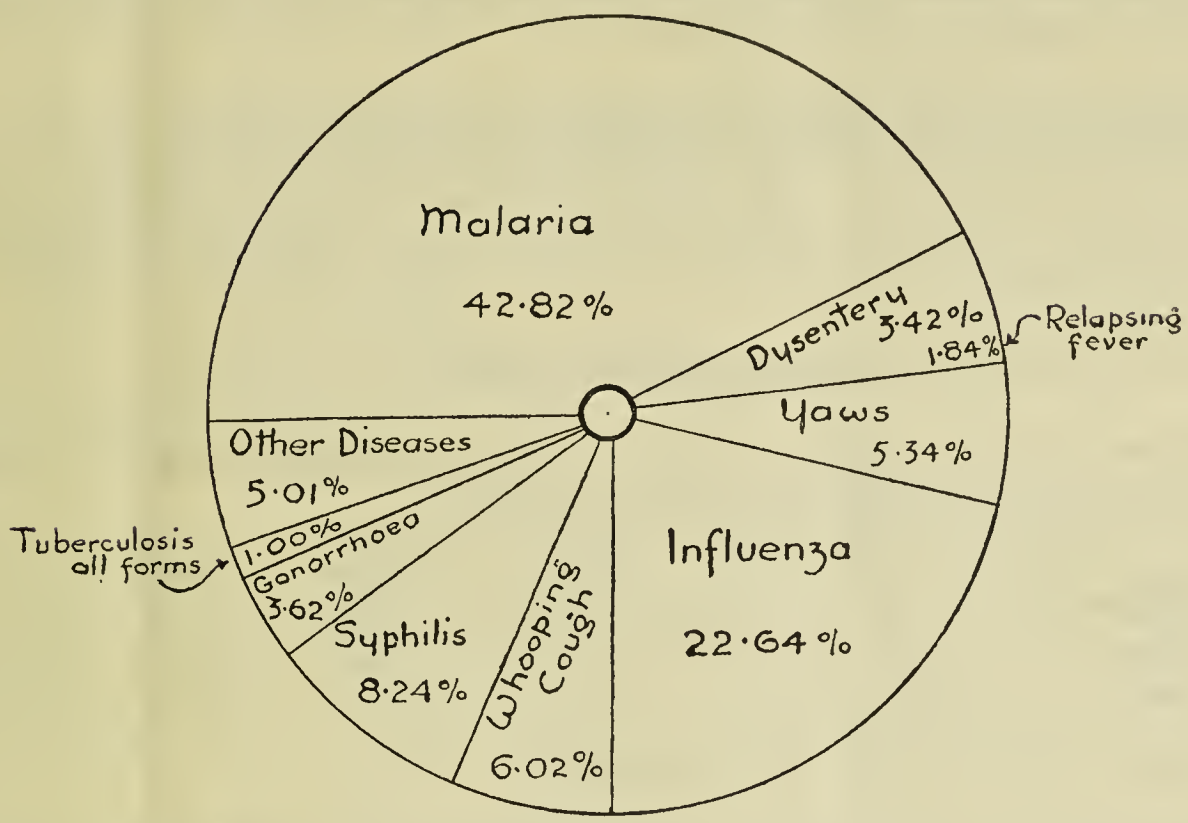


Diagram III.

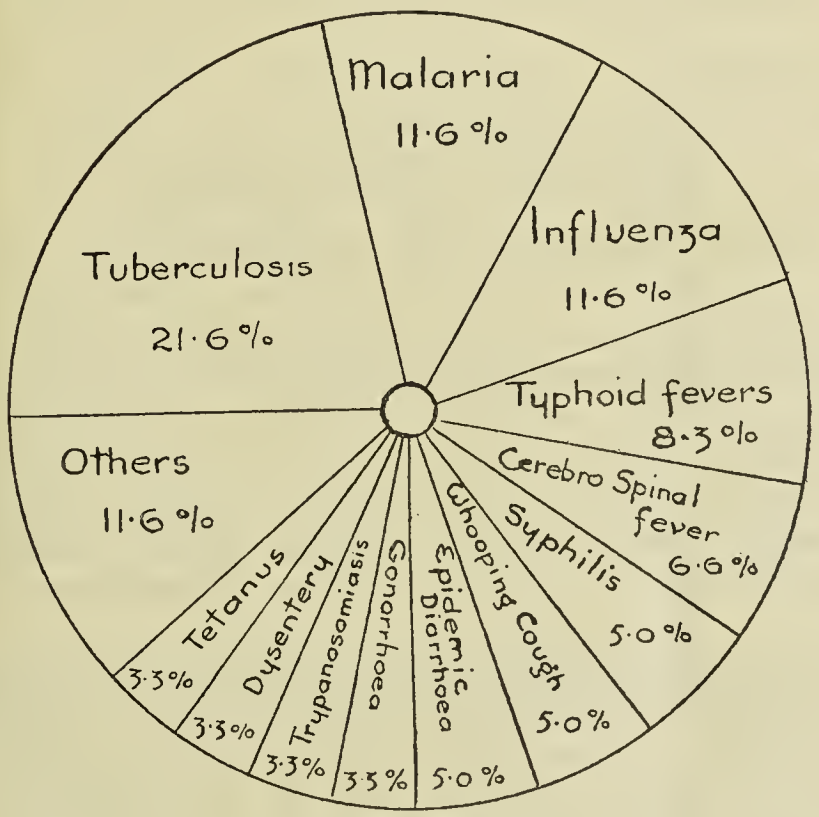
Total incidence, of epidemic, endemic and infectious diseases 10,351.



The diagram shows the proportion of the diseases in Group I treated at Government hospitals.

Diagram IV.

Total in-patient deaths amongst the epidemic, endemic and infectious diseases 60.



The diagram shows the proportion of in-patient deaths occurring amongst the diseases in Group I.

B. GENERAL DISEASES.

Malignant disease. Unfortunately available statistics do not afford much information with regard to the incidence of malignant disease among the native population.

The total number of cases reported was 18 as compared with 30 cases in 1932 and 29 cases in 1931.

Out of 29 specimens of tissue sent to the Laboratory for examination three were found to be of a malignant nature. For 1932 and 1933, 52% of the tumours from natives examined in the Laboratory were malignant; all the specimens were from natives dwelling in rural districts with one exception. Malignant disease is not uncommon in the African although the precise nature and site of the tumour may not coincide with that found in Europeans.

Rheumatism. The term rheumatism is a label used to denote a variety of chronic infections. Cases of true acute rheumatism must be very rare. One interesting case was reported in a native child who was admitted to hospital with a typical acute rheumatic syndrome; recovery left her with an adherent pericardium and well marked mitral disease.

The total number of cases recorded was 1,816.

Deficiency disease. The number of cases of deficiency disease occurring during the last four years are compared in the table below :—

	Scurvy	Pellagra	Beri-beri	Rickets
1930	137	252	1	—
1931	—	94	1	—
1932	3	104	1	—
1933	—	1	—	—

Pellagra. (Note by Dr. H. M. Shelley).

The majority of the cases of pellagra reported have occurred in the Central Prison, Zomba, but, during the year 1933 only one case of the disease was observed in that institution, despite the fact that the maize, which forms such a large part of the weekly food ration was definitely of very poor quality. Apart from this the diet remained in quantity, exactly the same as during the previous six years.

Diet. The food as supplied according to regulations constitutes a fairly well balanced native diet, and it is undoubtedly much superior to the nourishment obtained by the average villager. The total calorific value is somewhat low, in fact too low for prisoners undertaking heavy manual work. This could be remedied by increasing the meat ration to 3½ lbs. per week.

Vitamins. The diet is so constituted that a definite vitamin deficiency should not occur, all essential elements being present in one or other of the foods.

If an examination is made of the improvements which have been periodically made in the dietary it will be seen that such modifications have not had the remotest influence over the incidence of the syndrome, thus during the period 1910 to 1913, no maize was used, its place being taken by a rice ration, and 131 cases of pellagra were reported. In 1914, the diet was revised and improved and 12 cases occurred during the year. In 1920, the diet was again modified and no cases were seen, but during 1922 among the prisoners enjoying exactly the same food 41 cases were noted and in 1923 another 41 cases occurred. During 1924, the ration was again modified but 137 cases with four deaths were reported, whereas during 1933, only one case of the syndrome was noted, though the inmates received the same scale of diet.

Pellagra as it occurs in Nyasaland seems to be an institutional disease and though it is occasionally seen in members of the general native population, it is by no means common. Possibly, there is more than one way in which this peculiar syndrome can be produced. It is of interest to note that at the Lancashire County Asylum, at Winwick, 22 cases of pellagra were observed at a time when the inmates were better fed, clothed and housed than they had ever been before. Susman, who investigated some of these cases reached the conclusion that the syndrome is produced by a low grade infection acting chiefly on the endocrine glands, the alimentary tract and nervous system.

Overcrowding in the Prison. Ten years ago the local prison was overcrowded and it has become increasingly so with the passage of time. The herding together of as many as twelve individuals in one cell seems to favour the propagation of the disease, and it was formerly a common experience to find several inhabitants of one cell attacked one after another.

Fortunately, during the last year or two a system of isolation has been adopted, whereby, a prisoner suspected to be developing the disease is promptly removed from the main prison block.

Seasonal incidence. The maximum number of cases are seen during the months of June and October.

Treatment. During the last ten years experiments have been continuously conducted to find a suitable remedy for this disease. and the following measures have been adopted and tried :—

(1) High protein diet.
(2) High carbohydrate diet.
(3) Diet containing marmite.
(4) Diet supplemented by ½ pint of beer per day.
(5) Arsenical mixtures.
(6) Thyroid gland tablets.

With the exception of the treatment by thyroid, the condition appeared to be uninfluenced by any of the measures adopted. The thyroid medication occasionally produced amazing improvement in certain patients, but by no means invariably so. It is impossible to estimate the value of any treatment in pellagra, unless the patient is kept under observation for at least two years. A person frequently appears to make a complete recovery, only to relapse again possibly twelve or eighteen months later.

Modern writers tend to assess the value of any treatment in reference to pellagra, by observing the disappearance of the dermatitis. This method is however liable to error, for the erythema tends to disappear spontaneously without medication. A Roumanian professor reported the cure of pellagrins by the addition to their diet of large quantities of meat. He states that the "rash" under such regime disappeared in about three weeks. Actually, many cases have been observed in which the erythema has vanished in two weeks without treatment of any kind.

Conclusions. Is pellagra a pure deficiency disease? Rather may it not be regarded as a low grade "intoxication" either microbic or chemical in origin? The virulence of this "poison" is augmented at certain seasons of the year, and the individual tends to develop an immunity with the passage of time.

C. COMMUNICABLE DISEASES.

Mosquito or Insect Borne.

Malaria. No epidemic occurred during the year. 9,787 cases were recorded at Hospitals and Dispensaries. The hospital cases are classified as follows :—

Sub-tertian	...	...	...	953
Quartan	...	...	...	71
Benign tertian	...	...	...	1,134
Cachexia	...	...	...	61
Type undefined	...	...	...	2,214

This disease is prevalent throughout the country and is the cause of a considerable proportion of sickness. The classification, unfortunately, is not based solely upon microscopical examination. In one district only is it definitely known that the predominant type is benign tertian.

The incidence of malaria in the group of communicable diseases for 1932, was 23.41 per cent. and for the year under review, 18.56 per cent.

Blackwater fever. During the year eight cases of blackwater occurred, the distribution by race was as follows :—

European	....	....	....	3
Asiatic	....	....	....	5

Among methods of treatment for this disease, blood transfusion has now been tried in cases occurring amongst Europeans. In each case the haemoglobinuria ceased shortly after the transfusion, but two of the patients died a few days later from asthenia—one of these was an old man, suffering from advanced tabes, who, six weeks

previous to the onset of blackwater, had had an erythrocyte count of only three million per c.m.m. The action of the transfusion on one of the recipients was almost miraculous. This patient had suffered from extreme haemoglobinuria for 36 hours and the haemoglobin index was 30 per cent. She had marked air hunger and a muttering delirium—400 c.c. of citrated blood was transfused and within two hours her colour had improved, the air hunger ceased and she requested permission to eat a beef steak.

In all cases of transfusion, a blood grouping test was made and then a direct blood matching performed to confirm the choice of donor.

450 c.c. was the maximum amount of blood transfused at any one time. A selection of twenty healthy Europeans to act as donors has been made.

Group 1	...	...	...	1 donor.
,, 2	...	...	...	8 donors.
,, 3	...	...	...	3 ,,
,, 4	...	...	...	8 ,,

Thus it has been possible to procure 8 universal donors.

Dr. H. M. Shelley in 1931 made an analysis of sixty-seven cases of blackwater fever occurring in this country. He came to the following conclusions :—

(I) Malaria is widespread, 84 per cent. was due to *P. falciparum*, 14 per cent. to *P. vivax* and 2 per cent. to *P. malaria*.

(II) Anti-malarial measures as carried out are unsatisfactory, houses are not screened, mosquito boots often not worn, and nets are incorrectly used.

(III) No race is immune—50 cases occurred among Europeans and 17 among Asiatics.

(IV) There appears to be no relationship between the incidence of blackwater and the prevalence of malaria.

(V) 90 per cent. of the cases gave a history of repeated attacks of malaria.

(VI) Parasites were found in the blood of ten patients, in six of these *P. falciparum* was present and in three, *P. vivax*.

(VII) The susceptibility of an individual to blackwater appears to increase during the first year of residence and to diminish again until the sixth year when he again becomes susceptible.

Relapsing fever. The number of cases appearing in the returns for the last five years is as follows :—

1929	...	...	100	...	(one European)
1930	...	...	169	...	(two Europeans)
1931	...	...	253	...	(four Europeans)
1932	...	...	294	...	(one European)
1933	...	...	191	...	(four Europeans)

Tick fever appears to be becoming more widely distributed and the carriers of the diseases, in one locality, viz. at Mlanje, have infested the police lines, police offices, native clerical quarters and practically every building.

Trypanosomiasis. The number of cases returned for the last five years is as follows :—

1929	...	...	...	11
1930	...	...	...	2
1931	...	...	...	2
1932	...	...	...	10
1933	...	...	...	32

A large proportion of the cases (20) occurred in the Kota Kota district along the Kaombe, Bua and Dwanga rivers.

Infectious Diseases.

Smallpox—under Section III.

Yaws. During 1933, 1,966 cases were treated, as compared with 2,672 cases in 1932, 2,524 in 1931 and 1,707 cases in 1930. The majority of the cases occurred in the Lake shore areas at the lower altitudes.

Cerebro-spinal Meningitis. A total number of 12 cases were reported at Hospitals. A small outbreak occurred in the Fort Johnston district, with 22 deaths.

For the previous four years the returns have shown the following number of cases :—

1929	... ...	33
1930	... ...	Nil.
1931	... ...	26 with 16 deaths.
1932	... ...	4 with 2 deaths.

Enteric group of Fevers. For the four years prior to 1933 the following cases have been reported :—

1929	....	....	7 cases, all in Europeans, type undetermined.			
1930	....	....	10	„ 7	„	„
1931	....	....	35	„ 21	„	„
1932	....	....	21	„ 2	„	„ , 15 of these cases were typhoid and 6 paratyphoid. Agglutination tests showed 3. B. typhosus, 1. B. paratyphosus A, 3. B. paratyphosus B.

For 1933, twelve cases were reported, two of these being amongst Europeans and ten amongst natives.

Dysentery. A total of 1,692 cases of dysentery was reported, as compared with 2,450 in 1932, 2,270 in 1931, 4,784 in 1930 and 2,060 in 1929. 355 cases were treated at Hospitals; of these 240 were amoebic, 18 bacillary and 97 undefined.

Amongst Europeans occurred 30 cases of amoebic and seven cases of bacillary dysentery with no deaths. At Zomba, amoebic dysentery has been present in more or less epidemic form for the last few years, the incidence amongst Europeans is as follows :—

Year	Officials			Families of Officials			Non-Officials		
	No. of cases	Days off duty	Invalided	No. of cases	Total days sick	Invalided	No. of cases	Total days sick	Invalided
1931	... 4	... 39	... Nil	... 8	... 120	... Nil	... 2	... 24	... Nil
1932	... 3	... 41	... „	... 5	... 84	... „	... 1	... 28	... „
1933	... 12	... 140	... 1	... 6	... 119	... 1	... Nil	... Nil	... „

In 1929 one case only occurred and none in 1930. The method of disposal of the night soil and refuse is by means of open pits dug in the compounds of the official quarters. A water carriage system is now being installed.

Leprosy. A Government grant of £1,000 is distributed among twelve leprosy treatment centres maintained by the Missionary Societies. The amount provides for the food of the patients and the bare working expenses of the clinics.

Free issues of drugs and dressings are also made to these clinics.

The table below shows the average number at each centre under treatment for the last quarter of the year.

	In-Patients		Out-Patients	
	Male	Female	Male	Female
Bandawe	35.25	36.5	—	—
Domasi	17	12.25	—	—
Likoma	7.5	3.5	8.25	4.5
Likwenu	50.5	24.75	6	5.5
Livingstonia	—	—	38.5	28.75
Loudon	13.25	7.5	.5	1.25
Malamulo	121.5	28.25	4.0	4.0
Malindi	20.75	11.0	—	—
Mkhoma	5.25	4.0	1.75	.5
Mua	42.5	17.25	5.0	3.25
Mwami	20.5	14.5	—	—
Utale	60.5	21.75	3	1
TOTAL ...	394.5	181.25	67.00	48.75

163 new cases were treated as compared with 185 for 1932. Of the new admissions 121 were males and 42 females. There were 19 deaths, 16 male and 3 female: 55 males and 16 females were discharged or left of their own accord. No pressure is brought to bear upon patients in order to retain them in the centres. At Government Hospitals and Dispensaries 161 cases were treated.

Tuberculosis. The record of cases for the last 8 years is as follows:—

1926	1927	1928	1929	1930	1931	1932	1933
104	97	73	70	128	171	220	104

In the absence of a complete medical survey of any district or portion of a district, it is difficult to evaluate the figures given; probably a considerable number of cases of this disease do not present themselves for treatment. No special clinics have been established.

Venereal disease. During the year under review 1,383 cases of syphilis were recorded as compared with 2,063 cases in 1932, 1,267 in 1931 and 917 in 1930.

On the whole natives are attending more readily for treatment.

D. VITAL STATISTICS.

(i) GENERAL AFRICAN POPULATION.

The total native population for 1933 is given as 1,609,817, the census in 1931 gave a total of 1,599,888 as compared with 1,199,934 in 1926. The registration of native births and deaths is not compulsory, so that vital statistics are unfortunately not available. The experiment in registration commenced in May 1932 in the Fort Manning district was however continued. This system is in no sense official except that the individual compiling the figures is a Medical Officer and the recording officers are native officials of the Medical Department; chiefs and village headmen have no legal obligations in connection with the registration, nor can any steps be taken against a native who knowingly gives false information. These facts coupled with the lack of experience of the native recording officers, imply that the calculated rates are subject to a fairly wide margin of error, indeed, the rates for 1933, differ considerably from those of the previous year, except for the birth-rate, which is practically the same.

The figures do, however, show one or two features which appear to be constant, i.e. a slight excess of female over male births, of female over male still-births, and a considerable excess of female over male deaths in the older age-group.

The still-birth rate is very high, but it is probable that many of the recorded still-births were actually infantile deaths.

These apparent facts are of interest if an attempt is made to correlate them with the quinquennial census figures, which invariably show a large surplus of women in the adult age-group. The 1931 census, for instance, gives an adult population in the Fort Manning district of 19,640, 10,867 of these being women but the 1926 census shows an excess of males over females in the 5-15 age-group, so that the excess of adult women shown in the 1931 census cannot be attributed to a carry-over from the previous age-group.

On the other hand registered deaths indicate a higher mortality of adult females than adult males, from which it may be inferred that there is some factor unconnected with births and deaths, which has a marked influence on the sex distribution of the population.

This factor is almost certainly the emigration of adult males, plus the immigration of polygamous families.

Little or no progress has been made with the attempt to ascertain the causes of deaths; the native recording officers have only a very rudimentary knowledge of medicine, and record deaths as due to *chifua* or *mimba* or *malungo*, which mean respectively "chest" "stomach" and "fever." Of 233 infantile deaths recorded in 1933, 121 were ascribed to *chifua* and 40 to *mimba*. This may be taken to represent very roughly the prevalence of broncho-pneumonia and diarrhoea in the Fort Manning district.

The various rates for 1932 and 1933 are compared:—

	1932	1933
Birthrate per thousand	67.2	68.2
Death-rate ,, ,, ...	33	25.8
Infantile death-rate per 1000 births	141.3	97.3
Still-birth rate per 1000 live births	—	89.3

In 1933 the percentage of deaths by age-groups were :—

Infants	24.9
1—5 years	18.4
5—15 years	16.6
Adults	40.3

43.3 per cent. of the deaths occurred during the first 5 years of life.

(ii) ASIATICS.

The Asiatic population in 1933 was 1,474 as compared with 1,583 in 1932.

During the year there were 46 births and 8 deaths.

The causes of death were :--

	Males (Adults)	Infants	Females (Adults)	Infants
Blackwater fever	1	—	—	—
Cancer	--	—	1	—
Puerperal sepsis	—	—	1	—
Malaria	2	—	1	—
Broncho pneumonia	—	—	1	--
Septicaemia	—	1	--	—

(iii) EUROPEANS, GENERAL POPULATION.

The 1931 census showed the European population as 1,975; for 1933 the number given is 1,817.

During the year there were 46 births.

The Registrar recorded 14 deaths, the causes of which were :

Causes of Death.	Males	Infants	Females	Infants
Poisoning	—	—	1	—
Blackwater fever ...	1	—	1	—
Cerebral embolism ...	1	—	1	—
Cerebral haemorrhage and pneumonia	—	—	1	—
Heart failure	3	—	2	—
Tuberculosis general ...	1	—	—	—
Tuberculosis pulmonary ...	1	—	—	—
Typhoid	1	—	—	—

136 cases were admitted to Hospital and 485 treated as out-patients.

(iv) EUROPEAN OFFICIALS.

During 1933, 105 European officials were on the sick list and off duty for an average of 17.2 days each, as compared with 95 officials off duty with an average of 11.9 days each in 1932.

The daily percentage on the sick list was 2.4 compared with 1.4 for 1932.

There were 37 cases of malaria with a loss of 234 days, 11 cases of influenza with a loss of 89 days and 12 cases of amoebic dysentery with a loss of 140 days.

Two deaths occurred, one from enteric fever and broncho pneumonia and the other from embolism and heart failure.

Ten officials were invalided.

The following table shows the sick, invaliding, and death rates of European officials :—

	1930	1931	1932	1933
Total number of officials resident	257	270	267	282
Average number resident	192	213	212	202.6
Total number on sick list	89	114	95	105
Total number of days on sick list	1,304	1,727	1,136	1,808
Average number of days on sick list	3.5	4.7	3.1	4.9
Percentage of sick to average number resident ...	1.8	2.2	1.4	2.4
Average sick time to each patient (days) ...	14.6	15.1	11.9	17.2
Average sick time to each resident (days) ...	6.7	8.1	5.3	8.9
Total number invalided	0	5	3	10
Percentage invalided to total resident	0	1.8	1.1	3.47
Total deaths	2	1	2	2
Percentage of deaths to total residents	0.7	0.3	0.7	0.7

The causes of invaliding were :—

1. Sub-acute arthritis.
2. Sprue, after amoebic dysentery.
3. Rheumatic fever.
4. Dislocated lens of left eye.
5. Fibrositis.
6. Debility.
7. Debility and furunculosis.
8. Pityriasis.
9. Pulmonary tuberculosis.
10. Chronic nephritis.

(v) NATIVE OFFICIALS.

The native officials numbered 1,979 in 1933, excluding the native troops and casual labour in receipt of less than ten shillings a month.

Of this number 431 were on the sick list and off duty for a total of 6,336 days.

The prevailing disabilities and the days lost are compared below with those of the previous year.

	1932		1933	
	No. of cases	No. of days lost	No. of cases	No. of days lost
Malaria	82	477	58	325
Influenza	56	470	15	91
Injuries	46	443	42	523
Respiratory affections ...	45	310	53	744
Dysentery	18	328	16	201
Venereal diseases	10	169	20	464

Sixteen deaths occurred as compared with 11 in 1932 and 8 in 1931.

The causes of death were:—

1. Asthma and encephalitis.
2. Pulmonary tuberculosis.
3. Gonococcal septicaemia.
4. Ankylostomiasis and trauma of liver.
5. Nephritis and diabetes
9. Cirrhosis of liver.
7. Pleurisy.
8. Septicaemia.
9. Gastric ulcer.
10. Fracture of base of skull.
11. Gonorrhoea.
12. Pneumonia.
13. Pneumonia.
14. Pneumonia.
15. Typhoid fever.
16. Pleurisy.

There were no invalidings during the year.

TABLE SHOWING THE SICK, INVALIDING, AND DEATH RATES OF NATIVE OFFICIALS.

	1930	1931	1932	1933
Total number of native officials	1,545	1,714	1,848	1,979
Total number on sick list	381	545	544	431
Total number of days on sick list	3,894	5,817	5,135	6,336
Average daily number on sick list	10.6	15.9	14.0	17.4
Percentage on sick list	0.6	0.9	0.7	0.17
Average sick time to each patient (days)	10.2	10.6	9.4	14.7
Average sick time to each official (days)	2.5	3.3	2.7	3.2
Total number of deaths	4	8	11	16
Percentage of deaths amongst native officials	0.25	0.40	0.59	0.81

(vi) NATIVE TROOPS.

1ST BATTALION, KING'S AFRICAN RIFLES.

There were 329 admissions to hospital amongst the troops during the year compared with 306 during the previous year, whilst the number of cases treated as out-patients was 872 compared with 1,328 in the previous year.

There was one death during the year.

The average strength of the Battalion was	397
Daily sick rate was	3.77
Average daily number of sick in hospital was	14.95

SECTION III—HYGIENE AND SANITATION.

A. GENERAL REVIEW OF WORK DONE, AND PROGRESS MADE.

It is to be regretted that for financial reasons, the appointment of the three Health Visitors provided in the Estimates for 1931 could not be made and that for similar reasons the appointment of a third Sanitary Superintendent did not materialize.

The two Sanitary Superintendents are employed entirely in the larger townships and it is practically impossible with the staff and funds available to initiate and control any schemes for the betterment of the general native population. No increase of the African sanitation staff was possible.

In the Districts very little progress can be reported in the improvement of village sanitation and in any case it is doubtful if native sanitary inspectors are reliable in the performance of their duties unless adequately supervised and in this case the necessary supervision is entirely lacking.

It is interesting to note that in the report of the recent survey undertaken by the Agricultural Department the importance of cooperation between that Department and the Medical Department is emphasized and there is no doubt that the measures to be adopted in endeavouring to secure a diminution in the incidence of disease are those measures which are directed towards raising the standard of living and to the improvement of the methods af agriculture and stock raising, such measures to be effective require the cooperation and coordination of four Departments in particular, viz, the Agricultural, the Medical and the Education and Veterinary. Much may be accomplished without any great expenditure of funds by these departments working in harmony and unison under the aegis of a keen and capable administration.

I. Preventive Measures.

Malaria and Malaria Prevention.

The usual routine anti-malarial measures were continued in the larger townships and considerable progress was made in canalizing streams, in general bush-clearing and in building permanent storm water channels. The issue of quinine to all Post Offices for sale to the public was continued and is a measure which meets with general approval.

Epidemic Diseases.

Smallpox. The fourth year of the smallpox epidemic showed a considerable abatement of the number of cases. The majority of the cases occurred in the southern part of the Protectorate and more particularly in the districts bordering upon the Portuguese territories. The immigration of numbers of labourers, unprotected by vaccination, from these territories for work on European plantations is no doubt partially responsible for maintaining the incidence of the disease.

According to the returns during the last four years 1,366,593 persons have been successfully vaccinated. The total native population is estimated at 1,609,000 approximately.

No great reliance can be placed upon these vaccination figures, as the native vaccinators are left unfortunately much to their own devices, lack of funds preventing adequate supervision being given.

The number of cases of smallpox and the deaths for the past four years have been :—

	Cases.	Deaths.
1930	4,762	211
1931	7,414	239
1932	4,106	180
1933	3,412	96

VACCINATIONS WERE CARRIED OUT AS FOLLOWS :—

Station.	Successful.	Modified.	Unsuccessful.	Not seen.	Total.
Blantyre ...	5,100 ...	2,355 ...	1,339 ..	2,765 ...	11,559
Chikwawa and Neno	10,491 ...	5,308 ...	2,942 ...	481 ...	19,222
Chinteche ...	4,244 ...	2,998 ...	3,166 ...	2,295 ...	12,703
Chiradzulu ...	22,300 ...	7,144 ...	5,465 ...	3,069 ...	37,978
Cholo	19,004 ...	23,769 ...	985 ...	82 ...	43,840
Dedza ...	7,201 ...	3,179 ...	2,006 ...	1,205 ...	13,591
Dowa	10,231 ...	4,646 ...	2,790 ...	1,023 ...	18,690
Fort Johnston ...	13,499 ...	8,162 ...	1,269 ...	2,592 ...	25,522
Fort Manning ...	7,999 ...	6,789 ...	2,355 ...	— ...	17,143
Karonga ...	7,054 ...	465 ...	283 ...	— ...	7,802
Kasungu ...	1,383 ...	532 ...	415 ...	453 ...	2,783
Kota Kota ...	2,627 ...	1,440 ...	754 ...	— ...	4,821
Lilongwe ...	25,507 ..	2,554 ...	2,076 ...	— ...	30,137
Liwonde ...	5,973 ...	2,605 ...	1,649 ...	808 ...	11,035
Mlanje ...	16,523 ...	7,699 ...	4,725 ...	2,618 ...	31,565
Mzimba ...	9,880 ...	7,419 ...	5,114 ...	1,321 ...	23,734
Ncheu ...	15,156 ...	3,417 ...	3,476 ...	1,615 ...	23,664
Port Herald ...	14,668 ...	5,834 ...	2,944 ...	1,650 ...	25,096
Zomba ...	24,762 ...	1,226 ...	1,865 ...	10,031 ...	37,884
Total ...	223,602 ...	97,541 ...	45,618 ...	32,008 ...	398,769

Cerebro-spinal Meningitis. In the months of October and November a number (22) of mysterious deaths were reported from the Fort Johnston district. Investigations made on the spot, and examination of patients suffering from sickness similar to that which had caused the deaths, disclosed the existence of an outbreak of cerebro-spinal meningitis. Prompt measures were taken, and only 12 more cases with 6 deaths occurred up to the end of the year.

Influenza. 1,081 cases of influenza were reported with 30 deaths.

Helminthic Diseases.

An interesting investigation took place during the year into the incidence of intestinal parasites. The stools of 846 Africans and 279 Europeans residing in Zomba were examined, the following results are of interest; for full details see pages 68-70 of the Report of the Laboratory Section.

Africans	Negative	35.3	per cent.
	Hookworm ova	31.2	„ „ (The adult worm recovered in six cases was found to be *Necator americanus*).
	Bilharzia	1.4	per cent.
	Ascaris	3.4	„ „
	Taenia	1.0	„ „
Europeans	Negative	71.4	per cent.
	Ascaris	2.5	„ „
	Taenia	0.3	„ „

Ankylostomiasis. In the Karonga district a native dispenser travelled round the villages and gave 17,966 treatments for hookworm disease.

The number of cases reported was 14,069 as compared with 7,763 in 1932, and 5,816 in 1931; carbon tetrachloride (tetraform) is used generally by the native dispensers; no ill effects following its exhibition have been reported.

Schistosomiasis. 5,031 cases of schistosomiasis were reported during the year as compared with 6,702 cases in 1932 and 1,483 in 1931.

The disease is particularly prevalent in the low lying areas near the Lake shore.

In the Kota Kota district examinations of urine and faeces showed that *S. hæmatobium* was present in 82.1 per cent. of urines and *S. mansoni* in 6.8 per cent. of faeces.

II. General Measures of Sanitation.

No new sanitary works of any importance were planned or carried out during 1933. For various reasons work on the Zomba water-carriage sewage scheme has been held up, and though the essential part of the water supply has been completed, the scope of the sewage-disposal portion of the scheme has not yet been definitely settled nor has the money required to complete it been found. This delay is to be deplored because it means that Zomba will for another one or two years have to endure its present unsatisfactory system of night-soil disposal, with its attendant dangers from fly and water-borne disease.

The sanitary conditions of the tobacco stations in the central province have been investigated and found to be very unsatisfactory. During the buying season large numbers of native growers congregate at these stations for the purposes of selling their tobacco, and as no sanitary facilities or supervision have so far been provided, fouling of the ground surface is very evident. Moreover the stations become centres for the dissemination of infectious disease. As a preliminary measure, pit latrines are to be constructed at each buying-station, and sanitary personnel placed there for general sanitary supervision and to carry out such measures as vaccination, etc.

III. School Hygiene.

The European Schools at Blantyre and Limbe are inspected twice a year by the Senior Medical Officer and for 1933 Dr. R. Calleja reports as follows :—

" School inspections are carried out each year and each child was examined in detail and in accordance with the instructions issued with the medical inspection cards.

During the year a total of 68 children were examined, 37 girls and 31 boys. Any deviation from normal health was noted and the attention of the parents called to the abnormal feature.

The general health and physique of the pupils was excellent.

Certain details of the examinations are appended :—

	No. Examined.	Result.		Percentage affected.
Teeth ...	68 ...	29	required dental treatment ...	42.6
Tonsils ...	68 ...	4	enlarged tonsils ...	5.8
Eyes ...	68 ...	2	errors of refraction ...	2.9
Spleen ...	68 ...	1	spleen palpable ...	1.4

While details of ages, heights and weights are kept the numbers are at present too small to permit of any comparisons being made."

It has not been found possible with the staff available to make any medical inspections of African Mission schools.

IV. Labour Conditions

The last labour census was taken in January, 1930 and showed the total of employed male labour to be 58,120 (this figure includes children). The total male population was estimated at 611,924 on the 31st December, 1928.

Of the number of males employed in January, 1930, 6,768 were alien labourers from Portuguese territory and employed on, in the main, plantations in the Cholo-Mlanje area, the native labourer from the neighbouring territory being preferred to the local one.

Registered planters who maintain a dispensary for the treatment of their labour, although required by law to maintain a stock of drugs and dressings, are assisted by Government by being allowed to purchase from this department drugs and dressings at landed cost. Many of the planters also afford medical assistance to the local non-employed native who may seek relief.

Emigration also takes place to a considerable extent, although no statistics are, I believe, available, but natives from this Protectorate go to work in the mining districts of Rhodesia and during the Zambesi Bridge construction the monthly average of Nyasaland natives employed was stated to be 1,100. Returns from the Bridge construction would indicate that the health of the labour has been as the whole excellent, no serious outbreak of any epidemic disease having occurred. In 1933 there were only 5 deaths.

A resident Medical Officer, two European male nurses and varying numbers of native dispensers have been employed. A native hospital, dispensaries and dressing stations are maintained.

The diet has been adequate, vaccination has been a routine procedure and care has been taken to see that the sanitary arrangements are satisfactory and that the surroundings of the camps are kept clean and tidy.

Other concentrations of labour have occurred on the Northern Extension of the Nyasaland Railway to the Lake. The Medical Officer who visited the area for the purpose of inspection in September 1933 reported that the general health of the labour was good. Supplies of drugs and dressings are kept by the contractors, and all labourers are vaccinated on arrival.

The average periods of employment would appear to be rather short, and are estimated at 4-6 weeks only.

Two Indian Sub-Assistant Surgeons were employed on the Extension.

V. Housing and Town Planning.

The problem of housing natives who require accommodation in, or in the immediate neighbourhood of townships, is becoming acute. Native housing in towns is for the most part bad, and though Town Councils are fully alive to the situation, their financial circumstances are such that they are unable to undertake housing schemes out of their own resources.

Compulsory measures such as bye-laws prohibiting the residence of natives within a township except in certain specified areas are indeed necessary not only in the interest of public health but to enable Town Councils to prepare housing schemes with some prospect of the houses being occupied.

Housing schemes so far produced have been of two kinds,—(*a*) those in which an area of land is laid out in plots, and the natives encouraged to take up the plots either at a small rental or rent free, and to build houses thereon of a specified standard, and (*b*) those in which a Town Council is responsible for the construction of the houses and accessory works, and lets the houses to natives at an economic rental.

Of the two kinds the latter is unquestionally the better, because it does or should provide a better type of house and other amenities which a native community would certainly not provide on its own initiative.

Limbe has put into operation a scheme of type (*a*) and there a number of natives have already built houses on plots which they rent from the Council. At Blantyre the Council is hampered by financial difficulties, and has so far not been able to overcome them. Zomba has prepared a scheme of type (*b*) which if the necessary funds become available should go far to ameliorate the present very unsatisfactory state of affairs.

VI. Food in Relation to Health and Diseases.

In the larger townships such as Limbe, Blantyre and Zomba regular meat inspections are carried out by the Sanitary Superintendents, markets are well looked after, slaughter houses provided and the sale of fish controlled.

Dairies are a difficulty as native purveyors of milk are not under control.

In the absence of indications to the contrary it must be assumed that the diet standards accepted for white races are satisfactory for natives, so that the dietary problem resolves itself into one of education, education of the native in better methods of agriculture in order that better crops may be grown and education in better methods of feeding so that the native may learn to appreciate the value of an adequate dietary. Prison gardens should be encouraged and good and sufficient dietaries introduced into schools, hospitals and other institutions. It is, I believe, generally accepted that the African diet lacks animal protein and calcium so that any methods which may effect an increase in the meat supply or in the supply of foods rich in mineral contents, such as the groundnut and especially the sesame, are of the utmost economic value.

ABSTRACT FROM THE ANNUAL REPORT OF THE SANITARY SUPERINTENDENT, ZOMBA.

I. Anti-Mosquito Work.

Routine inspection of all premises in the Township has been systematically carried out by Sanitary Inspectors and Probationers, each Inspector or Probationer having an area alloted to him. 25,125 visits of inspection were made by native Inspectors during the year. Eighty-one collections of mosquito larvae were found on occupied premises. Of these collections only six were anopheles.

Sixty-five notices were served on householders in respect of the finding of mosquito larvae.

Four areas of swamp ground have been dealt with during the year. In each case the water-logged ground has been successfully drained.

Two of these swamp areas were found on rocky, earth covered, flats in the gully west of the European Hospital. This gully rises from Port Arthur bridge above P.W.D. Workshop in a series of flats to the mountain water channel above the European Hospital. The rock faces were cleared of earth which previously held up surface water and dry stone drains capable of taking storm water during heavy rains have been provided. In the execution of this work 1,185 yards of dry stone drains were constructed. The third swamp area dealt with was situated east of the new Electric Power Station and the fourth west of the power station and midway between the power station and Masonic Lodge. In these areas 340 yards of stone built subsoil drains have been provided, the subsoil water eventually discharging into open drains.

The difficulty of mosquito control in Zomba has been aggravated by the formation of small pockets containing water in the earth at the sides of streams. In order to overcome this and to prevent further erosion in water channels, a commencement has been made in the stoning-in of streams, the sides of streams being built up with dry stone and the stream beds paved with stone. During the year 1,734 yards of streams have been dealt with, the appearance of the streams has been improved and erosion stopped while earth pockets cannot now form in the streams dealt with.

In one case, where three streams pass through the plantation below the Power Station, it was decided to construct a new stream bed of dry stone, on completion of which the water from three streams was diverted to the new stone built stream-bed which is about 400 yards long 5 ft. in width with an average depth of 3 feet. In all, a total of 3,259 yards of stone drains have been constructed during the year.

The old stream-beds have been partially filled in with broken stone.

Cost of these drains is governed by the nature of the ground through which drains have to pass, excavations necessary, size of drains, and the distance stone has to be carried.

The construction of 2,259 yards of dry stone drains cost £147 6s. 8d. or approximately 10½d. per yard. Of the above sum £67 was from the Sanitary and Drainage Vote, granted in respect of the construction of drains from the vicinity of the power station to Victoria Avenue; 642 yards of drains were constructed with this vote at an average cost of Shs. 2/1 per yard.

Constructional work ceased with the beginning of the rains and inspection of the drains after heavy rains showed that in every case the sides of the drains remained undamaged. The only effect of great flows of water being the dislodgement of some of the paving stones placed in the stream beds. One may conclude that the work carried out has been successful.

Subsoil drains provided for swamp areas during the past four years have been kept under observation and in no case has repair or maintenance been required. The ground in each case remains dry.

The usual routine work has been continued. Shell anti-malarial mixture being used in oiling standing water which is generally to be found at roadsides due to the absence of adequate road drainage.

During the rains from two to four men are continually employed in cleaning roof gutters. This work is of considerable importance since gutters become choked with dead leaves and are liable to form breeding places for mosquitos.

For a period of two months two men were employed in searching for holes in trees, cutting and draining same, or filling them in if cutting was impracticable.

The following statement shows the numbers of collections of mosquito larvae found and the rainfall during the past four years:—

	Collections of mosquito larvae.	Rainfall.
1930	266	37. 2 inches.
1931	211	56.93 ,,
1932	315	39.27 ,,
1933	193	41.29 ,,

SUMMARY OF ANTI-MOSQUITO WORK CARRIED OUT IN ZOMBA TOWNSHIP.

Anti-Mosquito Work 1933.	Anopheline.	Culex.	Stegomyia.	Totals.
Number of inspections of premises				25,125
Collections of mosquito larvae found	60	119	14	193
In houses and compounds	6	66	9	81
In wells and drains	24	23	1	48
In pools and open spaces	30	30	4	64
Percentage of houses and compounds inspected and found to be breeding larvae				3.9
Intimations served in respect of mosquito larvae offences				65
Inspections of drains				4,689
Inspections of pools and wells				2,587
Holes and excavations filled				150
Yards of drains dug				4,151
Yards of drains and streams cleared				40,223
Square yards of swamp ground drained by means of sub-soil drains				10,694
Gallons of oil used				45
Square yards of elephant grass uprooted and dhub grass planted				93,573
Square yards of grass cut (approximately)				1,200,000

II. General Nuisance Work.

25,125 visits of inspection were made to occupied premises by native Inspectors with a view to the detection and suppression of nuisances.

Two hundred and seventy-three nuisances were reported and in respect of each a notice was served. Conditions likely to give rise to nuisance were brought verbally to the notice of those concerned, no record being kept of verbal intimations.

The majority of the nuisances dealt with arose from lack of supervision of refuse pits and the manner in which night-soil was disposed of.

Under existing conditions, nuisances of this nature are bound to arise; there is not one householder in Zomba who has not contributed in some measure to the danger arising from flies. This can be understood when it is considered that householders are responsible for disposal of nightsoil and refuse from their houses. The work falls upon native servants who are without knowledge or appreciation of the danger arising from improper disposal. A decrease in the number of flies is unlikely so long as the present system is in operation.

The need for boundaries of plots to be fixed is urgent as it is often difficult to decide whether or not a nuisance is on a householder's plot and dissatisfaction is frequently expressed in this connection when intimations of nuisances are served.

Seven complaints were received with regard to servants' quarters being infested with bugs and fleas and fourteen complaints with regard to houses in which flies had become unbearable.

In each case investigation was made and remedial measures taken.

The native lines, in which Government native employees are housed, cannot be said to be in good sanitary condition. High standing crops are planted on the ground within a few feet of the houses, portable latrines are misused and sufficient staff is not available to regularly control the area. Periodic visits only can be paid to the lines with the result that the authors of nuisances cannot be found nor can sanitary discipline be established.

A summary of general nuisance work is given below:—

SUMMARY OF GENERAL NUISANCE WORK, ZOMBA, 1933.

Visits of inspection to premises	25,125
Nuisances reported	273
Intimations served	273
Verbal intimations given	No record kept
Dumps of refuse removed	55
Inspections of ash pits	26,550
,, of latrine pits and pits used for the burial of night-soil ...	31,672
Collections of fly maggots found	45
Notices served calling for new refuse pits to be dug	116
Disinfection and disinfestation of premises	21
Gallons of disinfectant used	71
Cwts. of lime used in the limewashing of latrines, etc., ...	21
Number of rats caught	4,646
Number of prosecutions	Nil

III. Anti-Rat Work.

Two men are employed in setting rat traps in premises throughout the Township.

An average of twenty premises a day are trapped. Rats caught totalled 4,646 of which number 2,284 were doe rats.

IV. Disposal of Nightsoil and Refuse.

As stated in the section on general nuisance work, householders are responsible for disposal of nightsoil and refuse from their houses.

All public, office and servants' latrines are controlled by the Health Office. A staff of 14 latrine attendants is employed.

Latrines are washed out every morning and buckets are emptied and cleansed twice daily, night-soil being buried in pits in nearby open spaces. Each latrine is limewashed once in every three weeks.

V. Drainage.

Defective road drainage has proved a constant source of trouble during the rains.

Choked culverts and partial flooding of roadways has occasioned work and expense from which the department should be free.

Water lying in pools by roadsides has to be sprayed with anti-malarial mixture in order to prevent the breeding of mosquitoes. When culverts become choked by reason of their inadequate size, consequent flooding frequently produces additional mosquito breeding grounds. These matters have been reported from time to time but nothing has yet been done to remedy the condition.

VI. Meat Inspection.

The carcasses of all animals slaughtered in the Township were examined and where diseased conditions were found, the affected parts were condemned and buried.

The following statement shows the number of carcasses examined and diseased conditions found :—

Animals slaughtered.	Carcasses and organs condemned.
98 Oxen	1 Whole ox carcass because of anaemia.
	6 Ox livers on account of hydatid cysts. 56 ox livers due to distomatosis. 26 ox lungs due to inflammatory conditions.
50 Pigs	1 Whole pig carcass due to cysticercus cellulosae and one which died while being conveyed to the abattoir and on examination was found to have died of lobar pneumonia.
	3 Pig livers because of worm parasites and 13 pigs' lungs due to inflammatory conditions.
822 Sheep }	The livers of 6 sheep and 10 goats were condemned because of
729 Goats }	distomatosis. 550 sheep livers and 531 goat livers condemned because of other worm parasites.
	The lungs of 60 sheep and 78 goats were condemned because of inflammatory conditions.

VII. Food Inspection.

All foodstuffs, with the exception of milk are examined when exposed for sale in stores or at the market.

Zomba's milk supply is obtained from many sources. In 1930 an investigation was made which revealed that no less than 33 persons sold milk in the Township. A list was made showing the names of suppliers and purchasers. Suppliers include Europeans and a large number of natives.

Until recently all milk was delivered in old whiskey or vermouth bottles. The mouths of the bottles being closed with leaves rolled up to form a seal shaped like a cork.

Control, or even periodic inspection, of the premises from which milk is supplied is impossible since the suppliers live in scattered villages throughout the district.

Certain of the European suppliers have, I believe, done much to improve matters but as their premises are at some distance from the Township it has not been possible to visit them, except in the case of Chirunga Estate which being only two miles from Zomba is regularly visited.

Many Europeans still continue to purchase milk from natives and to accept delivery in old bottles in the manner already described although every European must know something of the danger of infection through milk.

VIII. Education.

Training of Native Sanitary Inspectors.

Classes for the training of native Sanitary Inspectors were held from April until October.

There were six probationary inspectors in the class. It was however found necessary to dismiss one man on account of misconduct. The five remaining men completed the course and sat for the Sanitary Inspector's examination which was held on the 7th, 8th and 9th of November; all five passed.

IX. Market.

Some improvement has been effected in the Market. A new building for the sale of fish has been built and terraces have been constructed for the accommodation of natives selling fruits, vegetables, snuff, etc.

The need for a fly-proof building for the sale of meat remains to be met. It is hoped that the Town Council will consider the provision of such accommodation.

The revenue from the market justifies the erection of suitable buildings.

ABSTRACT FROM THE ANNUAL REPORT OF THE SANITARY SUPERINTENDENT, BLANTYRE.

European Housing.

There are 118 European dwelling houses in the Township. No new houses were built but two sets of business premises were converted into residential premises.

None of the houses are mosquito proofed.

Native Housing.

Native quarters are attached to most dwelling houses and in addition there are six native locations in various parts of the Township. Proposals have been laid before the Town Council to develop the native location site at Naperi and negotiations are proceeding with Government concerning the transfer of the land.

Nightsoil Removal.

Nightsoil is removed daily by motor transport during the early hours of the morning and disposed of by trenching. The two bucket system is in use.

Indian and Native Latrines.

Indian and native latrines consist of brick and cement squatting blocks with a bucket in the centre.

During the year 47 insanitary latrines were reconstructed to the type approved by the Council.

This work was undertaken by the Health Office and the cost recovered from the property owners. The native latrines beside the Administration Offices and at the Market were demolished, and new blocks of latrines were built out of monies provided by Colonial Development Fund.

There are 10 blocks of public latrines totalling 31 buckets for males and 16 buckets for females.

Five labourers were fully employed cleaning these public latrines.

Refuse Collection and Disposal.

All occupied premises were supplied with portable bins which are the property of the Township, and are hired out. Refuse is collected daily by motor lorry and tipped into disused brickpits in various parts of the Town.

A covering of earth is placed over the refuse daily.

Water Supply.

Water is taken from the upper reaches of the Mudi and tributary streams and conveyed by gravitation to a sedimentation tank and then through a battery of Bells' filters. This water is then delivered, by gravitation, to all parts of the Town. A liming plant is used to correct acidity. A reserve of 130,000 gallons of filtered water is stored in a tank provided for that purpose. Samples of water from the various parts of the system were sent to the Government Laboratory, Zomba, for analysis. Immediately after heavy rains some discolouration of the water is experienced. To counteract this two Paterson's filters have been added to the existing battery of filters. From the end of July, water restrictions were enforced but a minimum supply of four hours daily was given.

Work was commenced on the new dam and it is expected that the water impounded will be available before next dry season.

Anti-Mosquito Work.

Regular inspections were made throughout the Town. Where mosquitoes were found on occupied domestic premises, a notice was served. In no case was it found necessary to take legal action. Labour was regularly employed in cutting rank vegetation on the banks of the streams.

Stagnant water was sprayed with anti-malaria oil or Paris green, a special staff being employed for this purpose.

Anti-Malarial Drainage Work.

The drain from the Hospital to the Mudi River was completed but suffered severe damage from the heavy storms in December. Two drains running through the centre of the Town were made up in permanent materials.

The damage has been only partially repaired as the cost is considerably more than the Blantyre Town Council are able to provide funds for at the present time.

The total length of the drain constructed was 2,070 yards. The expenditure was met from the Colonial Development Fund.

In addition 1,900 yards of the road-side drain were constructed in permanent materials, to do away with mosquito breeding places.

The drain through Sunnyside was dug out and a quantity of stone collected. This work is to be completed in the coming year.

The drain running through the Location, occupied by servants of the Medical Department was made up for a distance of 70 yards, but was destroyed by storm water in December.

General Sanitation.

Daily inspections were made in the Town for the detection and suppression of nuisances, and where nuisances were found to exist notices were served. 290 nuisances were reported and abated. During the rains labour was regularly employed in cutting long grass.

The Council employed labour for the purpose of reconstructing and repairing existing drains. 2,480 yards of permanent drains were constructed on private premises. This work was done by the Department and the cost recovered from the property owners.

Towards the end of the year the Council stopped this work in order not to compete with contractors established in the Township. 1,524 collections of mosquito larvae were made. In each case the necessary action was taken.

Colonial Development Fund.

The following is a list of works undertaken and completed with monies provided from this Fund :—

(1) 3,950 yards of permanent drains.
(2) Slaughter house.
(3) Native quarters at slaughter house.
(4) Native latrines at slaughter house.
(5) Meat market consisting of 20 booths.
(6) Fish market.
(7) Native eating house.
(8) Old meat market reconstructed as a vegetable market.
(9) Water supply to market.
(10) Office at market.
(11) Terracing and drainage of market.

Food Inspection.

Regular visits were made to all food stores and 92 cases of provisions, 234 tins of food and 318 lbs. of meat surrendered and destroyed. 50 fish were seized and destroyed.

ABSTRACT FROM THE ANNUAL REPORT OF THE SANITARY SUPERINTENDENT, LIMBE.

Housing.

European. There are 43 European houses in the Township, only one of which is mosquito proofed. No new houses were built during the year.

Indian. There is an Indian housing estate on the border of the Town and 25 houses constructed of burnt brick with iron roofs have been erected.

One new house was built during the year.

Native Location.

The land provided for a native location was opened up. A road 30 feet wide was cut to give access from the Blantyre side and a number of plots were marked out, each plot being 60 by 40 feet.

Town Council labour was housed in temporary grass houses but it is proposed to rebuild a number of these houses in permanent materials. Plots have been let out to employers of native labour or to the natives at a rent of 1/- per month. Any house constructed on these plots must be of a type approved by the Town Surveyor and Sanitary Superintendent. Type drawings of suitable huts were prepared.

Nightsoil Removal.

During the early part of the year a double bucket system of nightsoil removal was inaugurated.

A motor lorry and 400 buckets were provided by the Colonial Development Fund.

The night-soil is disposed of by trenching.

The Nyasaland Railways and Imperial Tobacco Company employ their own labour and carry out their own conservancy.

Discussions have taken place with a view of bringing these two concerns into the Township service. There are four blocks of public latrines all of which are emptied and cleaned each day.

Refuse Collection and Disposal.

Portable dustbins, the property of the Council are hired out to the occupiers of premises. Refuse is collected daily by motor transport and is emptied into disused brickpits in various parts of the Town.

These refuse dumps are regularly covered with soil.

Water Supply.

Water was obtained from boreholes in various parts of the Town.

Seven boreholes are the property of the Town Council and 2 are privately owned. Each borehole is approximately 80 feet deep and has a capacity of 4,000 gallons per day.

The water when analysed was found to be suitable for all domestic purposes.

Anti-Malarial Works.

Regular inspections were made in all parts of the Town, and, where larvae were found on domestic premises, a notice was served.

In no case was legal proceedings necessary. The Limbe stream was canalised in stone and cement for a distance 110 yards.

The first main drain in the location was made up in stone and cement and measures 127 yards in length.

Rank vegetation was cut regularly in all parts of the Town.

General Sanitation.

Daily inspections were made throughout the Town for the detection and suppression of nuisances.

46 notices were served for the reconstruction of insanitary premises.

In each case the work was carried out by the Town Council at the expense of the owners.

Two blocks of property were completely demolished, and this work was carried out under the terms of a Sanitary Notice.

Colonial Development Fund.

The extensions to garages and offices were completed. The meat market, vegetable and maize markets were opened.

The native eating house and the terracing of the market were completed.

1,800 yards of drains were constructed and a refuse destructor was completed.

Food Inspection.

Periodical visits were paid to all food-stores in the Town.

524 articles of food were surrendered and destroyed.

SUMMARY OF ROUTINE INSPECTIONS.

Collections of mosquito larvae found	133
Drain inspections	3,006
Well inspections	707
Pools inspected	271
Refuse receptacles inspected	810
Latrine inspections	11,254
Drains cleared	720
Yards of drains constructed (in permanent materials)	1,800

217 Nuisances were reported and abated.

NOTE :—All routine inspections are made by native staff.

B. MEASURES TAKEN TO SPREAD THE KNOWLEDGE OF HYGIENE AND SANITATION.

Ordinary routine work, clearing bush, canalising streams, oiling of mosquito breeding places, protection of water supplies are the main methods of propaganda.

Hygiene forms part of the curriculum of the Jeanes' School and instruction is given in infant welfare and mothercraft to the wives of the students.

A few native sanitary inspectors have been posted to native districts and endeavour to effect some improvement in the conditions of living and the sanitation of villages. The establishment of rural dispensaries, many of which are erected in permanent materials has provided a method of propaganda which is readily understood by the native population and has established confidence and faith in European methods of treatment and in European medicines.

C. TRAINING OF SANITARY PERSONNEL.

With the exception of the routine instruction given to the probationer native sanitary inspectors employed in the township of Zomba, no training has been carried out as owing to the financial situation it has been found impossible to make any increase in the sanitary personnel.

D. RECOMMENDATIONS.

Apart from the recommendations already made in Section VI of this Report for the construction of a new European Hospital at Zomba any other recommendations must be concerned with the general improvement of public health conditions and it is particularly at a time such as this when every country in the world is passing through a period of economic distress, that the attention of Government should be directed towards measures aimed at enhancing the prosperity of the Protectorate. As this is in the main an agricultural country all such measures must be directed to the general improvement of agricultural production, but to be successful they must be combined with other measures designed to raise the standard of living, the standard of health and the mental equipment of the native cultivator and his family. In other words the improvement of the village, and the education of the villager is really the first step in the progress of any policy designed to promote the prosperity of the native community.

It is by cooperation only that successful results are likely to be obtained.

In the improvement of conditions of rural life, six departments are principally concerned, viz., the Agricultural, Medical, Public Works, Forestry, Education and Veterinary and the problem should be attacked by means of a carefully planned campaign, each department having its place in the programme.

Very briefly the measures to be undertaken to promote prosperity may be outlined as follows:—

(I) Improvement in agricultural methods;
- Consolidation of holdings.
- Provision of better seed.
- Conservation of manure, use of manure pits, use of agricultural implements, ploughs, etc.

(II) Improvement in stock;
- Protection of stock from diseases.
- Better pasturage.

(III) Improvement of water supplies;
- Wells—washing places, bathing places, watering places for stock.

(IV) Improvement of communications;
- Roads, bridges, connections with railway.

(V) Afforestation;
Fuel supplies.
Supplies of timber for building purposes.

(VI) Provision of schools for girls and women.

(VII) Conservation and preservation of food supplies;
Storage, rat proof stores.
Destruction of vermin.

(VIII) Public health and medical work.

(*a*) Improvement of villages;
Use of latrines.
Use of rubbish pits.
Better houses.
Clean surroundings.
Instruction in hygiene.
Instruction in precautions to be taken against epidemic and infectious diseases.
Anti-malarial measures.

(*b*) Welfare of women and children.
Employment of Health Visitors.
Training of native midwives.
Education of women and girls.

(*c*) Establishment of Dispensaries.
Training of native dispensers.
Training of native sanitary inspectors.
Improvement of market places.

(*d*) Propaganda by Native teachers, dispensers, sanitary staff, Jeanes' teachers, etc.,
Printed pamphlets, posters,
Health shows, baby shows,
Magic lantern lectures,
Cinematograph films,
Demonstration of model houses, model villages.

Hitherto owing to lack of funds and shortage of staff it has been found possible to carry out a few only of the measures suggested above; the following recommendations are made therefore with a view to putting some of these measures into practical effect:—

(*a*) A general increase in the African sanitary staff is urgently required in order that every district may have its quota of staff.

The improvement of housing conditions, village sanitation, market places, water supplies, etc., depends to a great extent on such provision.

(*b*) In order that this staff may be really effective it is necessary to provide both adequate supervision and continuous instruction so that an increase in the establishment of European sanitary superintendents is essential.

(*c*) The provision of European Health Visitors to inaugurate measures in connection with infant and womens' welfare.

(*d*) The training of native midwives.

(*e*) The introduction of European nursing sisters into the larger native hospitals, so that the standard of nursing may be improved and the training of native dressers may be undertaken.

(*f*) The appointment of a Medical Officer trained in child welfare duties, a necessary measure, to ensure that any scheme may be commenced *ab initio* on the right lines.

(*g*) A considerable increase in the funds provided for transport in order that Medical Officers may visit their districts, inspect and supervise their rural dispensaries, supervise the work of the vaccinators, inspect and sanitate the smaller trading centres, inaugurate campaigns for the provision of latrines, cleaner villages, inspect schools, deal with outbreaks of epidemic diseases, etc., in fact undertake those duties which should be properly undertaken by the Medical Officer of Health of a district.

In order to further coordinate the work of the various departments concerned in the improvement of the village, the establishment of a central school where native workers could be instructed on sound lines and in the same principles is an essential, and possibly for this purpose the Jeanes' School might be utilized.

The subjects for instruction would be :—

Simple agriculture,
Care of stock, dairying, etc.,
Village hygiene and sanitation,
Infant welfare and domestic science for the wives of students,
Propaganda work,
First aid,
Simple systems of cooperation, credit, etc.,
Education, the three Rs,
Forestry, the importance of conservation of forests, tree planting.
Handicraft—carpentry, masonry, etc.

After training on these lines it should be possible to evolve a type of worker who might be termed a village welfare instructor who could perhaps take the place of the agricultural, the medical and the veterinary subordinate already working in native districts.

He would work directly under the Administration Officer on the advice of the technical officers posted to the district.

In this connection and an example of what is already being done, I quote from a report of a recent meeting of the Advisory Committee on Education in Nyasaland :—

"A scheme has been prepared to link up with the Jeanes' Supervisors' course (principally concerned with improvement in village education and social welfare) the Native Authorities' course (principally concerned with rural reconstruction)."

SECTION IV. PORT HEALTH WORK AND ADMINISTRATION.

A detention camp for immigrants is situated at Port Herald. During the year 175 immigrants (78 men, 48 women and 49 children) were detained for varying periods in the camp.

SECTION V. MATERNITY AND CHILD WELFARE.

While considerable progress is being made in infant welfare by the various missionary societies and work is increasing at the Jeanes School, the Medical Department clinics erected at Fort Johnston and Port Herald lie idle for want of staff.

The clinic at Kota Kota is not yet completed.

The main objects of an infant welfare centre are stated by Dr. H. H. C. Gregory to be as follows :—

"(I) The maintainance of a good standard of health in the infants and young children of the district.
(II) Education of the mothers.
(III) Treatment of minor ailments.
(IV) The early detection of disease."

It will be obvious, therefore, that for the successful management of a a welfare centre a Medical Officer and trained Health Visitors are necessary. At both Fort Johnston and Port Herald Medical Officers are stationed.

There is no doubt that ample scope for this branch of medical work is presenting itself throughout the country and measures directed at the objectives outlined in the preceeding paragraph are of fundamental importance in the endeavour to lower the infantile mortality rate which, as statistics show, is appallingly high.

No real progress in public health can be anticipated until the women are educated in the management and care of their children.

Two clinics are assisted by Government funds and have been established, one at Bandawe under the aegis of the Livingstonia Mission and the other at the Church of Scotland Mission, Blantyre.

The Bandawe clinic is under the charge of a trained nurse and was commenced in January, 1931, at Karonga by Miss Grant who visited villages and arranged fortnightly meetings of mothers and prospective mothers at the station. The attendances averaged about 30. The work, however, unfortunately ceased with the departure of Miss Grant in September, 1931.

The clinic was removed to Bandawe and recommenced on the arrival of another nurse in October, 1932.

This clinic obtains a grant of £350 a year from Government.

The returns for the quarter ending the 31st December, 1933 were rather disappointing as no confinements had actually taken place in the clinic. The number of new cases amounted to 12 mothers and 14 children.

For the year under review the figures are as follows—

No. of new cases—mothers	...	...	36
,, ,, ,, ,, children	...	...	189
Ante-natal clinic, mothers	...	...	33
Admitted for confinements	...	...	7

The clinic at Blantyre was commenced in 1932 under the care of Dr. Janet Welch and a trained Nursing Sister.

In 1932, for the period April to September 69 confinement cases were admitted, of these 49 were normal labour cases and 16 abnormal—47 living children were born and 18 still born.

The monthly attendance averaged 92.1.

Midwifery lectures and classes in physiology, infant welfare, etc., were held.

Three students attended the full course of lectures in connection with the training of native midwives—and in all since September, 1931, seven certificates have been issued.

The majority of the women who have obtained the certificates are practising in their own villages—records are kept of their cases and from what I have personally seen of their work I should judge it to be most successful.

For the period October, 1932—September, 1933, there were 150 admissions to the clinic, 69 were normal labours and 64 abnormal, 93 living children were born and 41 were stillborn.

In the infant welfare clinic there were 113 admissions, and in the mothers' welfare centre a total of 1,015 attendances was secured.

There were 5 pupil midwives. Classes were held from 12th May until 16th September and during that period 46 cases were seen by the pupils.

A new welfare centre was opened at Ndirande in September, 1933, a brick house has been erected with a view to its becoming the residence of the trained midwife. Attendances are very satisfactory.

At the Blantyre centre, a total of 11 maternal deaths took place from the following causes :—

Ruptured uterus	...	...	6 (3 being directly attributable to native medicines).
Placenta praevia	...	...	1.
Malaria and abortion	...	...	1.
Pelvic peritonitis	...	...	1.
Contracted pelvis	...	...	1.
Toxic jaundice	...	...	1.

At the Jeanes' School situated about 10 miles from Zomba the child welfare clinic already established was continued with the arrival of a trained nurse in June.

The main activities are centred upon the wives and children of the students, although a promising start has been made in outside health-visiting and ante-natal work. Expectant mothers from the neighbouring villages who attend at the clinic are visited during their confinement at their own homes, the wives of the students however, come into the maternity ward for confinement. Classes are held in sewing, child-welfare, mothercraft, house-keeping, hygiene, nursing, handicraft. As a proof of the value of the instruction given it is only necessary to take a walk round the houses of the students, when the general cleanliness of the children, the presence of tables and chairs, clean cooking utensils, cups, plates and tablecovers, flowers displayed in vases, etc., etc., will be readily observed.

The returns for the half year provide the following useful information :—

Visits paid by Health Visitors	...	...	12
Mothers admitted to clinic, ante-natal		...	24
,, ,, ,, ,, for confinement		...	5
Ante-natal examinations	...	...	87
Total confinements, including district	...	...	17
Total number of still births	...	...	3
Total number of premature births, miscarriages, etc.,			5
Children admitted to clinic ...	...	...	51
Total number of new cases in and out patients,			
Mothers	...	...	179
Children	...	...	544
Total number of attendances at clinic,			
Mothers	...	...	348
Children	...	...	1,894

SECTION VI. HOSPITALS AND DISPENSARIES.

European Hospitals. Two European hospitals are maintained by Government, one at Blantyre and one at Zomba. No private institutions or nursing homes exist in the Protectorate with the exception of a small amount of accommodation which is or may be reserved for Europeans at certain Mission hospitals.

The quality of the hospital accommodation provided by Government leaves much to be desired and the hospital at Zomba in particular is in an exceedingly dilapidated and insanitary condition, the equipment is old and meagre; no X-ray facilities are provided at any Government institution.

Suggestions for a new hospital at Zomba have been put forward and provision for the purchase of an X-ray plant has been made.

The European Hospital at Blantyre is in charge of a Senior Medical Officer and accommodates 10 patients.

The number of officials admitted during the year was 12 males and 1 female.

The number of non-officials admitted during the year was 45 males and 52 females. 42 official and 216 non-official out-patients were attended to. There was one death.

The European Hospital at Zomba is in charge of a Medical Officer and can accommodate a maximum of 10 patients.

The number of officials admitted during the year was 27.

The number of non-officials admitted during the year was 39.

There was one death among the official population and 3 deaths among the non-officials (including one case of blackwater fever).

Native Hospitals. Mainly as a result of recommendations made in 1930 by Dr. Shircore twelve new native hospitals have been erected from loan funds and additions have been made to three existing hospitals.

In only one native hospital, viz., that at Zomba has the employment of European nurses been accomplished. There is no doubt that as soon as financial conditions permit, European nursing sisters should be provided at all the larger hospitals in order that improvement may take place in the nursing and care of patients which is at present of a very low standard and to ensure that some organized training of native dispensers and dressers may be commenced.

No infectious diseases hospital as such exists in the Protectorate.

Dispensaries. The total number of dispensaries maintained throughout the year in rural and urban districts was 92.

All these dispensaries were originally wattle and daub buildings, but 36 have been replaced by permanent structures by means of the Colonial Development Fund. The standard of work performed at these dispensaries, although the number of cases reported show an increase over the figures for last year, cannot be considered satisfactory. There has been practically no supervision by Medical Officers owing to lack of motor travelling allowance and in some cases, I regret to say, whole districts have not been visited. Native dispensers left to themselves for months and even years at a time cannot be expected to perform their duties efficiently and considerable wastage in drugs and dressings through unskilled use is bound to occur, returns cannot be checked and are often obviously incorrectly rendered, diagnoses cannot be verified.

The following statement shows the health conditions in the individual districts of the Protectorate.

NORTHERN PROVINCE.

North Nyasa (Karonga) District. Area, 3,117 sq. miles. Native population, 44,917. European population, 24. Asiatic population, 9. During the year the Chikulamayembe area was transferred to the Mzimba district, the transfer resulting in a loss of 1,361 sq. miles and 12,426 of the native population.

There are five rural dispensaries, two of which, at Deep Bay and Ifumbo, are built of permanent materials. The total number of out-patients treated at the dispensaries this year is 16,007 as compared with 18,775 for 1932 the decrease being accounted for by the transfer of the area already alluded to.

Treatment for hookworm disease was continued on similar lines to that of 1932; a native dispenser travelled round the villages and a total number of 17,966 treatments were given.

The hospital at Karonga accommodates 50 patients and during the year there were 313 admissions and 9,115 out-patients were treated.

The figures for the last three years are as follows:—

	In-patients.	Out-patients.
1931	251 ...	11,177
1932	344 ...	10,619
1933	312 ...	9,115

Kota Kota District. Area, 1,963 sq. miles. Native population, 73,361. European population, 24. Asiatic population, 10. The new 50-bedded hospital was in commission during the year. The number of in-patients treated was 309 as against 308 during 1932.

The number of new cases treated as out-patients was 15,569 as against 13,139 for 1932. A satisfactory increase. 13,181 new cases with 41,508 reattendances were dealt with at the four rural dispensaries. These figures although not definitely reliable show a large increase over the figures for attendances in 1932, which were, new attendances, 11,449, reattendances 29,486.

Smallpox. 74 cases were reported as against 83 for 1932.

Trypanosomiasis. 20 new cases occurred. All the patients came from the Kaombe, Bua and Dwangwa rivers on the Lake shore area north of Kota-Kota.

Relapsing fever. 79 cases were dealt with. This disease is thought to be spreading over the whole district.

Infant Mortality. The figures for a population of 4,990 over a period of 16 months are as follows:—

Births.	Deaths	(i) Under 2 yrs.	(ii) 2 yrs. to 5 yrs.	(iii) over 5 years.
133	117	23	4	90

The deaths in children under 2 years of age amounted to 23 and of this number bronchitis accounted for 17.

The birth-rate was 26 per 1000; and the death-rate, under five, 5 per 1000 and over five, 18 per 1000. These figures are approximate only—

Sanitation. 27 new pit latrines have been constucted during the year.

Villages in the neighbourhood of Kota-Kota are now asking for latrines and no doubt the demand will increase as soon as the advantages of latrines are realised.

Village cleaning is being proceeded with and instruction in hygiene is given by the Sanitary Inspector.

Mombera District (**Mzimba**) Area, 3,458 sq. miles. Native population, 134,757. European population, 34. Asiatic population, 14. The new 30-bedded native hospital at Mzimba was completed in September and is now in use.

For the last 3 years figures for in and out-patients have been as follows :—

	1931	1932	1933
In-patients	146	115	115
Out-patients	3,553	3,641	4,326

The number of rural dispensaries, viz., 5, was increased by one owing to the inclusion of CHIKULAMAYEMBE, and the total number of patients treated was 13,208, showing an increase of 2,240 without counting the new area.

Kasungu District. Area, 3,948 sq. miles. Native population, 29,539. European population, 11. Asiatic population, 10.

The new native hospital of 30 beds was completed during the year.

The following table shows the number of in and out-patients treated at the hospital during the year :—

	In-Patients		Out-Patients	
	1932	1933	1932	1933
Africans	136	200	2,994	3,157

There are three rural dispensaries in the district; two are built of permanent and one of temporary materials.

The number of new cases treated was 5,348.

Ncheu District. Area 1,132 sq. miles. Native population, 79,788. European population, 64. Asiatic population, 30.

There is a small hospital with accommodation for about 10 patients in charge of a native Hospital Assistant at Ncheu.

There are five rural dispensaries in the district four of which are permanent buildings and one temporary.

During the year 203 cases were admitted to hospital as compared with 220 in 1932.

The out-patient cases numbered 4,663 and 2,001 in 1932. 11,596 cases were treated at the rural dispensaries compared with 10,556 cases in 1932.

Upper Shire District. Area, 2,045 sq. miles. Native population, 60,972. European population, 22. Asiatic population, 16.

A main dispensary in charge of a Hospital Assistant is maintained at Liwonde. Accommodation for patients who have come long distances for treatment is provided by a few wattle and daub huts.

The number of in-patients treated was 120 as compared with 138 for 1932.

Out-patients numbered 3,185 as against 1,650 for 1932.

There are seven rural dispensaries in the district and 12,838 cases were treated as compared with 9,622 cases for 1932.

As, however, no Medical Officer visited these dispensaries during the year, these figures cannot be considered altogether reliable.

West Nyasa District. Area, 2,572 sq. miles. Native population, 49,080. European population, 12. Asiatic population, 5.

At Chinteche there is a dispensary in charge of a Hospital Assistant. Seven round huts serve as rest houses for natives who have come for treatment from considerable distances.

The number of in-patients treated was 912 male and 266 females.

The number of out-patients treated during the year being 4,864 males and 4,423 females.

There are three other dispensaries in the district, two being of permanent and one of temporary construction.

South Nyasa District. Area, 2,468 sq. miles. Native population, 112,640. European population, 60. Asiatic population, 71.

There is a hospital with accommodation for some 50 patients at Fort Johnston where a Medical Officer is stationed.

A special clinic has been constructed to accommodate maternity cases and to serve as a child-welfare and ante-natal clinic; a Health Visitor's house has also been built. Unfortunately owing to the economic depression no staff has been available for carrying out this important activity.

The largest number of cases seen in the group of general systematic diseases belong to the respiratory affections, bronchial catarrh associated with catarrh of other mucous surfaces is the most common and would seem to be a disease of nutrition.

Smallpox. The average number of cases per month of smallpox throughout the year was 30 but a well marked decline was observed towards the end of the year.

Cerebro-spinal meningitis. A small outbreak occurred in October with 22 deaths and 3 further cases in November. The patients admitted to Hospital were treated by cisternal puncture and the administration of antiserum intra-cisternally and intravenously. Clinical improvement was rapid and the Medical Officer is satisfied that convalescence was hastened and complications avoided by this method of treatment.

Malaria. Subtertian malaria is the commonest type. One case of blackwater fever occurred in an Indian patient. It is pleasing to record that increasing numbers of natives are presenting themselves for operative treatment; many cases of interest were dealt with during the year.

Rural Dispensaries. There are four rural dispensaries, two of which are permanent buildings constructed of brick and iron, the remaining two being of unburnt brick and thatched roofs.

The numbers treated show a steady increase.

1931.	New cases	6,173
1932.	„ „	7,873
1933.	„ „	8,147

The number of patients admitted during 1933 was 576 as against 430 for 1932 and 418 for 1931. Out-patients numbered 4,576 compared with 4,468 in 1932 and 4,095 in 1931.

Fort Manning District. Area 1,453 sq. miles. Native population, 34,113. European population, 25. Asiatic population, 13.

There is a native hospital of 30 beds with a Sub-Assistant Surgeon in charge.

There were 295 in-patients and 2,583 out-patients treated during the year compared with 244 in—and 2,498 out-patients for 1932.

There are 3 rural dispensaries, two built of permanent materials and one wattle and daub. 6,463 new cases were treated with 39,315 subsequent attendances.

A small attempt to decrease the incidence of jiggers was made by a thorough cleaning up of seven villages; pigs were found to be a reservoir. 176 persons and 409 pigs were treated.

An attempt to discover the approximate number of epileptics in the district through the agency of the itinerant vaccinators resulted in a count of 271 cases and 29 deaths among a population of 34,000, approx.

Figures showing vital statistics were kept and were obtained by dividing the district into 4 areas, to each area being apportioned a vaccinator who collected data from the villages in his area and by this means the following figures were obtained:—

	Deaths. Ages.				
Diseases	One year or below	2—5 years	6—10 years	11—15 year and over	Total
Chest diseases including pneumonia and malaria ...	130	114	128	39	411
Dysentery, diarrhoea, etc. ...	29	34	7	10	80
Total ...	159	148	135	49	491

A total of 2,280 births were recorded of which 214 were still births. The deaths recorded were 911.

A certain amount of anti-malarial work has been carried out and several swamps in the station have been drained. Three springs have been protected and cleared.

Dowa District. Area 2,145 sq. miles. Native population, 121,771. European population, 40. Asiatic population, 50

A Sub-Assistant Surgeon is in charge of the district. A 30-bedded hospital is maintained at Dowa.

The number of new cases both Asiatics and Africans treated in hospital during the last three years is shown in the table below:—

	In-Patients.			Out-Patients.		
	1931	1932	1933	1931	1932	1933
Asiatic and African ...	99	144	148	11,571	11,761	18,446

Of the 18,446 out-patients treated, 3,602 were seen at the Native Hospital and the remainder at the rural dispensaries.

There are three permanent rural dispensaries in the district and three temporary ones; an additional temporary dispensary was opened during the year on the new Lilongwe—Salima road.

Lilongwe District. Area 2,334 sq. miles. Native population, 137,716. European population, 99. Asiatic population, 105.

The total number of new patients treated shows an increase over the figures for 1932, 265 in-patients and 2,764 out-patients being treated in 1933 as against 219 in-patients and 2,562 out-patients in 1932.

There are three rural dispensaries one being semi-permanent (brick with grass roof) and the other two temporary wattle and daub buildings.

The number of new cases treated at the dispensaries shows a falling off as compared with 1932, only 3,704 being seen as against 5,384 in 1932.

This is probably due to the almost total lack of supervision by the Medical Officer owing to the curtailment of the transport vote.

The number of cases of smallpox showed a remarkable decrease which may be attributed to a material decline in the incidence of the disease, and also to more effective measures being taken to vaccinate the juvenile population.

Malaria remains one of the chief problems of the district and one in every five cases admitted to hospital suffers from the disease.

Venereal cases show a slight increase and it is satisfactory to note that the natives are presenting themselves more readily for treatment.

An interesting case occurred of an adherent pericardium and mitral disease following upon acute rheumatism.

149 European cases were treated with no deaths.

A piped water supply derived from the river has been installed for the township.

All the district headmen visited the hospital during the year and were shown round it, short lectures on simple hygiene were given by the Medical Officer who also explained the advantages of hospital treatment.

Dedza District. Area 1,818 sq. miles. Native population, 137,022. European population, 94. Asiatic population, 30.

A hospital of 24 beds is maintained at Dedza and is under the care of a Medical Officer.

The comparative figures for the last three years with regard to the number of patients treated at the hospital and the five rural dispensaries are as follows.

	1931	...	1932	...	1933
In-patients, Dedza	194	...	195	...	170
Out-patients, Dedza	1,730	...	2,608	...	3,282
Out-patients, Dispensaries	9,456	...	9,509	...	12,238

It is interesting to note that one of the Principal Headmen has taken steps to ensure that latrine pits are constructed in his district. This measure in conjunction with the treatment of hookworm should do much to reduce the incidence of this disease.

Mlanje District. Area 1,531 sq. miles. European population, 126. Native population, 135,219. Asiatic population, 93.

There is a new native hospital accommodating 50 patients in charge of a Medical Officer.

The in-patient admissions have steadily increased during the past 3 years as the following figures show :—

1931—260, ... 1932—287, ... 1933—322.

Of 54 cases of malaria 28 were found to be malignant tertian and 5 benign tertian. It is interesting to note that no cases of blackwater fever have occurred amongst the Indian community since February 1932, as by means of propaganda the use of prophylactic quinine is now almost general; formerly a belief existed that taking quinine predisposed to blackwater.

Relapsing fever has since 1932 become endemic in the station and during the year 20 cases were treated. Both the police lines and the quarters occupied by the natives clerks are badly infested. The smallpox epidemic assumed serious proportions, no fewer than 833 cases being reported, the deaths, however, numbered 8 only and it is to be presumed that the disease occurred in a mild form.

The greatest number of cases occur in the vicinity of the Portuguese border as large numbers of unvaccinated labourers from Portuguese East Africa cross to Nyasaland to work on European estates. 30,173 vaccinations were carried out.

There are 6 rural dispensaries in the district, three of them being constructed of permanent materials, two of wattle and daub and one of brick with a grass roof.

During the year 8,210 new patients were treated at the rural dispensaries.

Zomba District. Area, 903 sq. miles. European population, 279. Native population, 110,148. Asiatic population, 136.

Medical facilities afforded in Zomba include a European Hospital, an African Hospital with 70 beds and a Medical Laboratory.

The European Hospital can accommodate at a maximum 10 patients. The number of cases admitted during the year amounted to 66 as compared with 79 in 1932 and 79 in 1931. Of this number 27 were officials. The average number in hospital per diem was 2.24. There were four deaths; one official died of enteric fever and broncho-pneumonia and three deaths occurred among the general European population from the following causes,

(a) Blackwater fever,

(b) Heart failure,

(c) Poisoning.

There were 45 cases of malaria during the year as against 33 last year.

There are six rural dispensaries in the district and 25,373 cases were treated during the year as against 29,261 last year, the decrease being due to the transfer of the Namadzi Dispensary to the Chiradzulu District.

Four of these are permanent buildings and one is built of bricks with a grass roof.

African Hospital. The number of in-patients admitted during the year numbered 1,061 and the out-patients, 5,923. The new hospital of 100 beds is almost completed and it is anticipated that it will be in use during 1934. The commonest conditions treated are ulcers and bronchitis—syphilis accounted for 204 cases which indicates a rather high infection rate in the native population. Ten maternity cases were admitted, one a normal labour and nine with complications. 57 operations were performed.

Cholo District. Area 624 sq. miles. European population, 162. Native population, 63,823. Asiatic population, 85.

A Hospital containing 50 beds is maintained at Cholo in charge of a Medical Officer. During the year 662 patients were admitted.

900 stools were examined for Helmith ova during the year with the following results:—

	%
Ankylostoma	34.65
Ascaris	6.15
Schistosoma mansoni	1.56
Ankylostoma and Ascaris	41.35
Ankylostoma and Schistosoma	12. 0
Ascaris and Schistosoma mansoni	1. 1
Ankylostoma, Ascaris and Schistosoma	3. 1

In 363 urines examined, *Schistosoma haematobium* was found in 308, i.e. 82 per cent.

Some hundred pamphlets were issued to the better educated native explaining the life history of the hookworm, the measures to be taken to avoid the disease and the treatment.

Blood slides from 100 native children were examined microscopically for malaria parasites and in 84 per cent. the parasites of benign tertian were found, in 4 per cent. a double infection of benign tertian and malignant tertian, 12 per cent. were negative. This finding does not agree with results recorded in other districts; sub-tertian is usually the predominant type.

There are 2 rural dispensaries in the district, both built of permanent materials. 3,095 male and 2,070 female new cases were treated with 23,298 subsequent attendances.

Blantyre District. Area, 860 sq. miles. European population, 666. Native population, 74,960. Asiatic population, 645.

There is a European Hospital at Blantyre in charge of the Senior Medical Officer.

During the year there were 112 Europeans treated in the hospital, of which 13 were officials (12 males and one female).

The daily average in the hospital was for non-officials....3.05.

" " " " officials.... .96.

Total 4.01

There are two rural dispensaries in the district, one of permanent materials at Lirangwe and the other of wattle and daub in a very dilapidated condition at Chileka.

There are two European schools, one in Blantyre with an average of 25 pupils and one at Limbe with an average of 50. The schools were inspected by the Senior Medical Officer twice during the year. 66 cases of smallpox were reported in the district and one case of diphtheria in a female native patient.

309 natives were sent to the Blantyre Mission hospital for in-patient treatment. This hospital is subsidized by Government.

Port Herald. Lower Shire District. Area, 747 sq. miles. European population, 20. Native population, 85,645. Asiatic population, 95.

The district is served by a Native Hospital of 50 beds in charge of a Medical Officer and by 8 rural dispensaries, five of which are constructed of permanent materials and three of wattle and daub.

At the Hospital 292 in-patients and 4,489 male and 4,216 female out-patients were treated. Of the total number of 8,705 out-patients attended to, 6,530 were reported to be suffering from ankylostomiasis.

Chiradzulu District. Area, 270 sq. miles. European population, 25. Native population, 80,193. Asiatic, 38.

A new hospital of 30 beds has now been completed and is in charge of an Indian Sub-Assistant Surgeon.

There are three rural dispensaries in the district, one of permanent and two of temporary construction.

The dispensaries treated during the year 7,609 males and 3,799 female cases.

There were 62,337 subsquent attendances.

The district is very thickly populated, the density being estimated at 296 to the square mile.

312 cases of smallpox with 18 deaths occurred during the year. A total of 290 in-patients and 5,076 out-patients were treated at the Native Hospital—10 deaths occurred.

Chikwawa District. Area, 1,897 sq., miles. European population, 7. Asiatic population, 10. Native population, 30,633.

A new hospital with 30 beds has been built from the Colonial Development Fund for this district, and is in charge of an Indian Sub-Assistant Surgeon.

The number of patients admitted to the hospital during the year was 135 as compared with 122 for last year,

3,695 out-patients were treated as compared with 2,724 for 1932. Four maternity cases were admitted which is an indication that the hospital has found favour with the female element of the native community.

Of the 3,695 out-patients, 954 were cases of conjunctivitis and a further 60 attended with corneal ulcers, trachoma, glaucoma and cataract.

Two cases of trypanosomiasis occurred, both patients being on a visit to this district and being natives of Portuguese territory.

SECTION VII. PRISONS AND ASYLUMS.

PRISONS.

CENTRAL PRISON, ZOMBA.

All prisoners on admission are medically examined and treated for any helminthic infestation or skin disease.

In 1930, 517 prisoners were examined and 30.75 per cent. were found infected with hookworm.

The admissions to the prison hospital are shown in the following table:—

	1928.	1929.	1930.	1931.	1932.	1933.
Number admitted to prison ...	229	206	228	219	239	413
Daily average in the prison ...	293	296	302	332	357	355.17
Number admitted to hospital	440	380	579	661	534	480
Daily average in hospital ...	34.6	24.2	34.4	40	36.3	34.68
Percentage in hospital ...	11.8	8.	11.4	12	10.1	9.5

The health of the prisoners may therefore be said to be as satisfactory as in other years.

Four deaths occurred during the year:—

Cerebral haemorrhage	1
Lobar pneumonia	2
Pleurisy	1

77.83 per cent. of the prisoners detained for 2 years and over showed a gain in weight.

Of the institutional diseases, 9 cases of amoebic dysentery, 2 cases of bacillary dysentery, and 14 cases of pneumonia occurred.

Pellagra. The number of cases recorded are as follows:—

1929	3 cases.
1930	115 „
1931	71 „
1932	88 „
1933	1 „

Some notes on this disease are given in Section II.

ASYLUMS.

A Central Lunatic Asylum in maintained for the whole of the Protectorate at Zomba. This asylum is administered by the Chief Inspector of Asylums who is also Commissioner of Police.

The establishment consists of a European Superintendent who is also in charge of the Central Prison and 19 male and 5 female native attendants.

The number of inmates on the 31st December, 1933 was 83 as compared with 80 at the end of 1932; of this number 70 were males and 13 females.

The daily average number of in-patients was 80.04.

The general health of the inmates was good; one case of pellagra occurred in a patient who had had six attacks since 1930.

All patients considered fit to work are given suitable employment in the gardens or in the asylum.

The patients are well looked after and well fed but from a medical point of view the institution falls into the category of a place of restraint rather than a mental hospital.

An Indian Sub-Assistant Surgeon with no particular knowledge of lunacy is in sub-medical charge and little or no attempt has been made to diagnose carefully the particular type of illness for which the patient is confined.

A small ward is used as a hospital and 36 admissions occurred during the year.

Unfortunately mechanical restraint (leg irons and handcuffs) is resorted to in a considerable number of instances and 31 male and 8 female patients were subjected to this form of control during the year.

A Medical Officer visits the asylum once a week or oftener if required.

There were two deaths during the year.

RECOMMENDATIONS.

(i) That the asylum should be in complete control of the Medical Department with a Medical Officer in administrative and executive control.

(ii) That a trained male European mental nurse should be engaged and be put in subordinate charge.

Returns.

TABLE I. STAFF.

EUROPEAN.

F. E. Whitehead, O.B.E.	Director of Medical and Sanitary Services, (Retired 4. 9. 1933).
A. D. J. B. Williams, O.B.E.	Director of Medical and Sanitary Services, (Appointed 5. 9. 1933).
H. H. B. Follit, ...	Senior Health Officer.
W. A. S. Lamborn, O.B.E.	Medical Entomologist.
R. Calleja	Senior Medical Officer.
H. G. FitzMaurice....	Medical Officer.
H. M. Shelley	,, ,,
T. A. Austin	,, ,,
W. H. Watson	,, ,,
W. L. Gopsill	,, ,,
P. P. Martyn	,, ,,
T. W. Stephens	,, ,, (Transferred to West Coast).
F. O. W. A. Mahon-Daly	,, ,,
L. C. Mayne	,, ,,
P. J. Bourke	,, ,,
R. N. Wilcox	,, ,,
E. J. Blackaby	,, ,,
H. D. Cronyn	,, ,,
Miss I. M. M. Aitken	,, ,, (On leave pending resignation).
D. P. Turner	,, ,, (Transferred from Zanzibar 8. 8. 1933).
C. H. Howat	,, ,, (Transferred from Cyprus. 23. 10. 1933).
R. A. Newsom	,, ,, (Re-appointed as from 7. 12. 1933).
(Vacant)	Bacteriologist.
Miss K. R. Cameron, M.B.E.	Matron.
Miss N. M. Cremen, M.B.E.	Nursing Sister.
Miss H. M. Phillips	,, ,,
Mrs. N. K. Clemence	,, ,,
Miss M. E. S. Cumming	,, ,,
Miss J. H. Marr	,, ,,
Miss H. C. Potter	,, ,,
Miss R. K. Ault	,, (On leave, pending resignation).
Miss A. Munro	,, (,, ,, ,, transfer).
Miss S. Johnson	,, ,,
Miss I. A. Frame	,, ,,
Miss E. F. McConachy	,, ,,
R. W. G. Pegg	Clerk and Medical Storekeeper.
V. T. Smithyman	Junior Clerk.
W. A. Willox	Sanitary Superintendent.
F. E. Weaver	,, ,,

ASIATIC.

Subadar Natha Singh	....	....	.... Sub-Assistant Surgeon.	(Retired 8. 2. 1933).
Jemadar B. T. Lele	....	....	.... ,,	,,
,, S. S. Kokari	....	....	.... ,,	,,
,, Lakhpat Singh	....	....	.... ,,	,,
,, G. D. Kashap	....	....	.... ,,	,,
,, B. Prasad	....	....	.... ,,	,,
,, Siraj-ul-Haq Khan	....	...	,,	,,
,, Jawand Singh	....	....	.... ,,	,, (Retired 17. 3. 1933).
,, R. L. Datta	....	....	.... ,,	,,
,, Dalip Singh	....	....	.... ,,	,,

AFRICAN. (Principal Members).

*T. D. Duncan	....	....	....	.... Senior Hospital Assistant.
*Leonard Makolera	....	....	....	.... Hospital Assistant.
Moses Kaunde	....	....	....	.... ,, ,,
*Godwin Maulidi	....	....	....	.... ,, ,,
Elliott Taumbe	....	....	....	.... ,, ,,
Leonard Mphamba	....	....	....	.... ,, ,,
E. G. Hoare	....	....	....	.... ,, ,,
Dyson David	....	....	....	.... ,, ,,
*Fred Nyirenda	....	....	....	.... ,, ,,
Harry Thomson	....	....	....	.... ,, ,,
Radford Botha	....	....	....	.... ,, ,,
Lawrence M'manga	....	....	....	Clerk.
Isaiah M. Jere	....	....	....	.... ,,
E. B. Mothello	....	....	....	.... ,, (*Deceased*)

*Passed examination for Senior Hospital Assistant.

TABLE II.—FINANCIAL.

(See Section I C.)

TABLE III.

RETURN OF STATISTICS OF POPULATION FOR THE YEAR 1933.

		Europeans.		Africans.		Asiatics.
Number of Inhabitants, 1933	....	1,817	....	1,608,023	....	1,474
Number of Births, 1933	....	46	....	(not known)	....	46
Number of Deaths 1933	....	14	....	(not known)	....	8
Number of Inhabitants, 1932	....	1,901	....	1,606,431	....	1,583
Increase	....		....	1,592		
Decrease	....	84	....		....	109

TABLE IV.

Shewing the Maximum, Minimum, and Mean Temperatures (Fahr.) and Total Rainfall in Various Districts during the Year 1933.

Station	Altitude Feet	Maximum Temp.	Minimum Temp.	Mean Temp.	Total Rainfall inches	No. of Days	Maximum fall in one day. inches
Port Herald ...	115	101	58	82.6	24.12	48	2.52
Cholo ...	3,000	99	49	70.4	39.15	94	3.70
Mlanje ...	2,400	—	—	—	41.70	88	2.33
Blantyre ...	3,000	93	49	68.9	40.77	55	3.19
Zomba ...	3,020.42	93	45	69.7	41.29	122	3.50
Liwonde ...	1,600	98	30	66.6	23.25	53	1.42
Fort Johnston ...	1,700	103	31	74.4	25.16	63	3.82
Dedza ...	5,250	90	39	61.9	41.90	83	2.59
Lilongwe ...	3,400	—	–	—	31.34	70	2.35
Fort Manning ...	4,228	91	—	—	33.41	78	1.74
Dowa ...	4,400	95	46	71.1	31.92	63	2.70
Kota Kota ...	1,800	110	46	78.3	44.41	68	5.12
Kasungu ...	3,500	104	35	72.6	22.60	46	2.21
Mzimba ...	4,500	89	45	70.7	28.58	64	1.75
Chinteche ...	1,800	95	38	72.1	61.86	83	2.57
Karonga ...	1,800	100	48	77.9	45.98	78	3.27

TABLE Va.—ZOMBA AND BLANTYRE EUROPEAN HOSPITALS.

Return of Diseases and Deaths (European In-Patients) for the Year 1933

Diseases.	Remaining at the end of 1932	Admissions during 1933. Zomba.	Admissions during 1933. Blantyre.	Deaths.	Total Cases Treated.	Remaining at the end of 1933
I. *Epidemic, Endemic and Infectious Diseases* :						
1. Enteric group—						
(b) Paratyphoid A. ..	—	1	—	—	1	1
(d) Type not defined	—	1	—	1	1	—
5. Malaria—						
(a) Tertian	—	—	2	—	2	—
(b) Quartan .	—	1	—	—	1	—
(c) Aestivo-autumnal	—	6	—	—	6	—
(d) Cachexia ...	—	—	1	—	1	—
(e) Blackwater ...	—	1	—	1	1	—
(f) Type not defined ...	—	4	13	—	17	—
11. Influenza ...	—	1	—	—	1	—
16. Dysentery—(a) Amoebic ...	1	13	7	—	21	1
(b) Bacillary ...	—	1	—	—	1	—
31. Tuberculosis, pulmonary and laryngeal ...	—	—	2	1	2	—
40. A. Gonorrhoea and its complications	—	—	1	—	1	—
II. *General Diseases not mentioned above* :—						—
50. Tumours non-malignant ...	—	—	1	—	1	—
58. Anaemia						
(*b*) Other ...	—	—	1	—	1	—
III. *Affections of the Nervous System and Organs of the Senses* :—						
82. A. Hysteria ...	—	1	—	—	1	—
B. Neuritis ...	—	1	—	—	1	—
C. Neurasthenia ...	—	—	2	—	2	—
85. E. Other affections of the eye ...		2	1	—	3	—
Carried forward	1	33	31	3	65	2

TABLE Va.—Continued.

Diseases.	Remaining at the end of 1932	Admissions during 1933.		Deaths.	Total Cases Treated.	Remaining at the end of 1933
		Zomba.	Blantyre.			
Brought forward ...	1	33	31	3	65	2
IV. *Affections of the Circulatory System*:						
88. Acute endocarditis ...	—	—	4	—	4	1
90. (b). Myocarditis ...	—	1	—	1	1	—
91. Diseases of the arteries :—						
(b). Arterio-sclerosis ...	—	—	1	—	1	—
96. Other affections of the circulatory system ...	—	—	1	—	1	—
V. *Affections of Respiratory System*—						
99. Bronchitis—(a) Acute ...	—	1	—	—	1	—
(b) Chronic ...	—	2	—	—	2	—
101. Pneumonia—(a) Lobar	—	—	1	—	1	—
(b) Unclassified ...	—	—	1	—	1	—
102. Pleurisy ...	—	—	1	—	1	—
105. Asthma ...	—	—	1	—	1	—
106. Pulmonary emphysema ...	—	—	1	—	1	—
VI. *Diseases of the Digestive System*:						
108. A.—Dental caries ...	—	—	9	—	9	—
Pyorrhœa ...	—	—	1	—	1	—
109. Affections of the pharynx or tonsils :—Tonsillitis ...	—	2	3	—	5	—
Pharyngitis ...	—	1	1	—	2	—
111. B.—Ulcer of the duodenum ...	—	—	1	—	1	—
112. Affections of the stomach—						
Gastritis ...	—	1	1	—	2	—
Dyspepsia ...	—	2	—	—	2	—
113. Diarrhoea and enteritis :—						
Under two years ...	—	—	1	—	1	—
114. Diarrhoea and enteritis :						
Colitis ...	—	—	2	—	2	—
Sprue ...	—	—	2	—	2	—
116. Diseases due to intestinal parasites :—						
(a). Taenia	—	1	—	—	1	—
(c). Nematoda (other than ankylostoma) ...	—	—	—	—	—	—
Ascaris	—	1	—	—	1	—
124. Affections of the liver :—						
Cholecystitis ...	—	—	1	—	1	—
Jaundice ...	—	—	1	—	1	—
VII. *Diseases of the Genito-urinary System : non-Venereal.*						
129. Chronic nephritis ...	—	—	2	—	2	—
131. Other affections of the kidney :—						
Pyelitis ...	—	2	4	—	6	1
132. Urinary calculus ...	—	—	1	—	1	—
133. Diseases of the bladder :—						
Cystitis ...	—	1	—	—	1	—
139. Uterine tumours (non-malignant)	—	—	1	—	1	—
141. B.—Other affections of female genital organs :—						
Dysmenorrhoea ...	—	1	—	—	1	—
142. Diseases of the breast (non-puerperal) :—						
Abscess of breast ...	—	—	1	—	1	—
Carried forward ...	1	49	74	4	124	4

TABLE Va.—Continued.

Diseases.	Remaining at the end of 1932	Admissions during 1933. Zomba	Admissions during 1933. Blantyre	Deaths.	Total Cases Treated.	Remaining at the end of 1933
Brought forward	1	49	74	4	124	4
VIII. *Puerperal State* :—						
143. A. Normal labour ...	1	5	13	—	19	1
B. Accidents of pregnancy :—						
Other accidents of pregnancy	—	—	1	—	1	—
145. Other accidents of parturition	—	1	—	—	1	—
146. Puerperal septicaemia ...	—	—	1	—	1	—
IX. *Affections of the Skin and Cellular Tissues* :—						
152. Boil ...	—	1	1	—	2	—
Carbuncle ...	—	—	1	—	1	—
153. Abscess ...	—	—	2	—	2	—
Whitlow ...	—	1	—	—	1	—
Cellulitis ...	—	1	1	—	2	—
155. Urticaria ...	—	—	1	—	1	—
Eczema ...	—	—	2	—	2	—
Ulcer ...	—	2	1	—	3	—
XIII. *Diseases of Bones and Organs of Locomotion (non-Tuberculous)*:						
156. Diseases of bones :—						
Osteitis ...	—	—	1	—	1	—
158. Other diseases :—						
Tenosynovitis ...	—	—	1	—	1	—
XII. *Diseases of Infancy.*						
162. Other affections ...	—	—	—	—	1	—
XIV. *Affections produced by External Causes.*						
165. Suicide by poisoning ...	—	1	—	1	1	
175. Food poisoning	—	—	1	—	1	—
178. Burns (by fire) ...	—	—	2	—	2	—
201. Fracture ...	—	1	3	—	4	—
202. Other external injuries ...	—	1	1	—	2	—
XV. *Ill-defined Diseases* :						—
205. Diseases ill-defined :—						
Shock ...	—	—	2	—	2	—
Pyrexia of unknown origin ...	—	1	—	—	1	—
Observation ...	—	2	—	—	2	—
Total ...	2	66	110	5	178	5

TABLE Vb.

Return of Diseases and Deaths (Native In-Patients) for the Year 1933.

Diseases.	Remaining at the end of 1932	Admissions during 1933	Deaths.	Total Cases Treated	Remaining 1933.
I. *Epidemic, Endemic and Infectious Diseases.*					
1. Enteric Group :—(a) Typhoid fever ...	1	5	3	6	—
(b) Paratyphoid A ...	—	2	—	2	—
(c) ,, B ...	—	1	—	1	—
(d) Type not defined ...	—	2	1	2	—
3. Relapsing fever ...	2	156	1	158	4
5. Malaria :—(a) Tertian ...	6	233	2	239	14
(d) Quartain ...	1	10	—	11	1
(c) Aestivo-autumnal ...	9	125	2	134	1
(b) Cachexia ...	—	29	2	29	—
(e) Blackwater ...	—	1	—	1	—
Type not defined ...	3	97	1	100	7
6. Smallpox ...	2	21	1	23	3
Alastrim ...	—	1	—	1	—
7. Measles ...	—	6	—	6	—
9. Whooping cough ...	—	36	3	36	—
11. Influenza ...	5	149	7	154	2
13. Mumps ...	—	4	—	4	1
15. Epidemic diarrhoea ..	—	14	3	14	—
16. Dysentery—(a) Amoebic ...	6	46	1	52	5
(b) Bacillary ...	1	8	1	9	1
(c) Undefined ...	1	9	—	10	1
10. Leprosy ...	2	32	2	34	6
23. Encephalitis lethargica ...	—	2	—	2	—
24. Epidemic cerebro-spinal fever ..	—	8	4	8	—
25. Other epidemic diseases :—(b) Chickenpox ...	2	22	—	24	1
(g) Yaws ...	12	122	—	134	5
(h) Trypanosomiasis.	2	21	2	23	2
28. Rabies ...	—	1	—	1	—
29. Tetanus ...	—	3	2	3	—
31. Tuberculosis, pulmonary and laryngeal ...	8	61	10	69	2
23. Tuberculosis, of the intestines or peritoneum ...	—	1	—	1	—
34. Tuberculosis, of the vertebral column ...	—	4	1	4	—
35. Tuberculosis, of bones and joints ...	1	13	—	14	1
36. Tuberculosis, of other organs :—					
(a) Skin ...	—	3	—	3	—
(c) Lymphatic ...	1	8	—	9	—
37. Tuberculosis, disseminated :—(b) Chronic ...	—	1	1	1	—
38. Syphilis :—(a) Primary ...	8	212	—	220	16
(b) Secondary ...	11	246	1	257	29
(c) Tertiary ...	1	34	—	35	—
(d) Hereditary ...	1	21	2	22	—
(e) Period undefined ...	—	5	—	5	1
39. Soft chancre ...	—	3	—	3	—
40. A. Gonorrhoea and its complications ...	6	208	2	214	28
B. Gonorrhoeal ophthalmia ...	—	15	—	15	—
C. ,, arthritis ...	—	5	—	5	—
41. Septicaemia ...	—	2	1	2	—
42. Other infections diseases ...	—	1	1	1	—
II. *General Diseases not mentioned above.*					
44. Cancer or malignant tumour of :—					
Stomach ...	—	2	1	2	—
Liver ..	—	3	3	3	—
45. Cancer or malignant tumour of :—					
Intestines .	1	1	—	2	2
46. Cancer or malignant tumour of female genital organs ..	—	3	1	3	1
48. Cancer or malignant tumour of skin ...	1	4	1	5	—
49. Cancer or malignant tumour of organs not classified ...	—	4	2	4	1
Carried forward	94	2,026	65	2,120	135

TABLE Vb.—Continued.

Diseases.	Remaining at the end of 1932	Admissions during 1933.	Deaths	Total Cases Treated	Remaining at the end of 1933.
Brought forward	94	2,026	65	2,120	135
50. Tumours non-malignant ...	3	46	2	49	—
51. Acute rheumatism ...	—	16	1	16	1
52. Chronic rheumatism ...	3	36	—	39	1
54. Pellagra ...	—	2	—	2	—
55. Beri-beri ...	—	2	1	2	—
56. Rickets ...	—	2	1	2	—
57. Diabetes (not including insipidus) ...	—	1	—	1	—
58. Anaemia :—					
Others ...	—	10	—	10	—
59. Diseases of the pituitary body ...	—	1	—	1	—
60. Diseases of the thyroid gland :—					
(a) Exophthalmic goitre ...	—	2	—	2	—
(b) Others ...	—	1	—	1	—
64. Diseases of the spleen ...	—	5	1	5	—
65. Leukaemia ...	—	2	—	2	—
66. Alcoholism ...	—	2	—	2	—
III. *Affections of Nervous System and Organs of the Senses*					
70. Encephalitis (not lethargia) ...	—	4	2	4	—
72. Locomotor ataxia ...	—	1	—	1	—
73. Other affections of the spinal cord ...	—	1	—	1	—
74. Apoplexy :—(a) Haemorrhage ...	—	1	1	1	—
(b) Thrombosis ...	1	—	—	1	—
75. Paralysis :—(a) Hemiplegia ...	3	17	1	20	2
(b) Other paralyses ...	3	14	—	17	1
77. Other forms of mental alienation ...	1	6	—	7	1
78. Epilepsy ...	2	36	1	38	1
Eclampsia, convulsions (non-puerperal) :—					
5 years and over ...	—	2	—	2	—
81. Chorea ...	—	1	—	1	—
82. A. Hysteria ...	—	2	—	2	—
B. Neuritis ...	—	9	—	9	—
C. Neurasthenia ...	—	1	—	1	—
D. Neuralgia ...	—	20	—	20	2
84. Other affections of the nervous system ...	—	2	—	2	—
Hiccough ...	—	1	—	1	—
85. Affections of the organs of vision.					
Diseases of the eye :—					
(b) Conjunctivitis ...	8	180	—	188	3
(c) Trachoma ...	—	8	—	8	1
(d) Tumours of the eye ...	—	1	—	1	—
(e) Other affections of the eye ...	5	67	—	72	4
86. Affections of the ear or mastoid sinus ...	1	27	—	28	1
IV. *Affections of Circulatory System.*					
87. Pericarditis ...	—	4	—	4	1
88. Acute endocarditis or myocarditis ...	—	6	1	6	—
90. Other diseases of the heart :—					—
(a) Valvular ...	1	22	1	23	1
(b) Myocarditis ...	—	3	—	3	—
Disordered action ...	—	5	—	5	1
91. Diseases of the arteries :—(a) Aneurism ...	—	3	—	3	—
(c) Others ...	—	3	1	3	—
92. Embolism or thrombosis (non-cerebral) ...	—	1	1	1	—
93. Diseases of the veins :—					
Varicose veins ...	—	4	—	4	—
Haemorrhoids ...	1	12	—	13	—
94. Diseases of the lymphatic system :—					
Lymphangitis ...	—	11	—	11	—
Lymphadenitis (non-specific) ...	—	18	—	18	—
Carried forward	126	2,647	80	2,773	156

TABLE Vb—Continued.

Diseases.	Remaining at the end of 1932	Admissions during 1933.	Deaths.	Total Cases treated.	Remaining at the end of 1933
Brought forward	126	2,647	80	2,773	156
V. *Affections of Respiratory System.*					
97. Diseases of the nasal passages :—					
Polypus ...	1	3	—	4	1
Rhinitis ...	—	1	—	1	—
Coryza ...	—	9	—	9	—
98. Affections of the larynx :—					
Laryngitis ...	—	5	—	5	—
99. Bronchitis :—(a) Acute ...	2	108	2	110	2
(b) Chronic ...	2	30	1	32	—
100. Broncho-pneumonia ...	—	62	9	62	1
101. Pneumonia :—(a) Lobar	3	92	16	95	3
102. Pleurisy ...	2	42	2	44	1
Empyema ...	1	2	1	3	1
105. Asthma ...	2	32	—	34	3
107. Other affections of the lungs ...	—	1	—	1	—
VI. *Diseases of the Digestive System :*					
108. Diseases of the teeth or gums :—					
Caries ...	—	16	—	16	2
Pyorrhœa ...	—	6	—	6	—
Gingivitis ...	—	6	—	6	—
B. Other affections of the mouth :—					
Stomatitis ...	—	16	1	16	—
Glossitis ...	—	4	—	4	—
Other diseases of the tongue ...	—	2	—	2	—
109. Affections of the pharynx or tonsils :—					
Tonsillitis ...	3	29	1	32	—
Pharyngitis ...	—	5	1	5	—
111. B. Ulcer of the duodenum ...	—	2	1	2	—
112. Other affections of the stomach :—					
Gastritis ...	—	12	1	12	1
Dyspepsia ...	—	30	—	30	—
Unclassified ...	—	4	—	4	—
113. Diarrhoea and enteritis :—					
Under two years ...	—	16	—	16	2
114. Diarrhoea and enteritis :—					
Two years and over ...	1	27	—	28	2
Colitis ...	1	22	—	23	—
Intestinal colic ...	—	6	—	6	—
115. Ankylostomiasis ...	17	414	10	431	28
116. Diseases due to intestinal parasites :—					
(a) Cestoda (taenia) ...	—	3	—	3	—
(c) Nematoda (other that ankylostoma) .—					
Ascaris ...	1	47	—	48	2
Oxyuris ...	—	5	—	5	—
(f) Unclassified ...	—	1	—	1	—
118. Hernia ...	1	21	3	22	—
119. A. Affections of the anus :—					
Fistula ...	1	4	—	5	1
Unclassified ...	—	3	—	3	—
B. Other affections of the intestines ...	—	12	2	12	1
Constipation ...	—	58	—	58	—
122. Cirrhosis of the liver :—					
(a). Alcoholic ...	—	1	—	1	—
(b). Other forms ...	—	1	—	1	—
124. Other affections of the liver:—					
Abscess ...	—	4	3	4	—
Hepatitis ...	—	4	—	4	—
Jaundice ...	3	11	4	14	1
127. Other affections of the digestive system ...	—	1	—	1	—
Carried forward	167	3,827	138	3,994	208

TABLE Vb.—Continued.

Diseases.	Remaining at the end of 1932	Admissions during 1933	Deaths	Total Cases Treated	Remaining at the end of 1933.
Brought forward	167	3,827	138	3,994	208
VII *Diseases of the Genito-urinary System (non-Venereal).*					
128. Acute nephritis ...	1	12	1	13	2
129. Chronic nephritis ...	—	3	1	3	—
130. B. Schistosomiasis ...	13	362	—	375	22
131. Other affections of the kidneys :—Pyelitis ...	—	9	—	9	—
132. Urinary calculus ...	—	3	—	3	1
133. Diseases of the bladder :—Cystitis ...	—	19	—	19	2
Others ...	—	2	—	2	—
134. Diseases of the urethra :—Stricture ...	—	2	—	2	—
Unclassified ...	—	3	—	3	—
135. Diseases of the prostate :—Hypertrophy ...	—	1	—	1	—
136. Diseases (non-venereal) of the genital organs of man :—Epididymitis ...	—	2	—	2	1
Orchitis ...	2	18	—	20	—
Hydrocele ...	—	25	1	25	—
Ulcer of penis ...	1	3	—	4	—
Unclassified ...	—	7	—	7	—
138. Salpingitis ...	—	5	—	5	1
Abscess of the pelvis ...	—	1	—	1	—
139. Uterine tumours (non-malignant) ...	—	3	—	3	—
140. Uterine haemorrhage (non-puerperal)	—	2	—	2	—
141. A. Metritis ...	—	3	—	3	—
B. Other affections of female genital organs :—					
Displacement of the uterus	—	1	—	1	—
Amenorrhoea ...	—	2	—	2	—
Leucorrhoea ...	—	2	—	2	—
Unclassified ...	—	4	—	4	—
142. Diseases of the breast (non-puerperal) :—					
Mastitis ...	1	5	—	6	—
Abscess of the breast ...	4	9	—	13	—
Unclassified ...	—	1	—	1	1
VIII. *Puerperal State.*					
143. A. Normal labour ...	—	22	—	22	—
B. Accidents of pregnancy :—(a) Abortion ...	1	11	1	12	—
(c) Other accidents	1	3	—	4	—
145. Other accidents of parturition ...	—	21	5	21	1
146. Puerperal septicaemia ...	—	3	—	3	—
149. Sequelae of labour ...	—	4	3	4	—
Vaginal fistula ...	—	1	—	1	—
150. Puerperal affections of the breast ...	—	2	—	2	—
IX. *Affections of the Skin and Cellular Tissues.*					
151. Gangrene ...	—	2	—	2	—
152. Boil ...	—	18	—	18	—
Carbuncle ...	—	3	—	3	—
153. Abscess ...	5	172	1	177	8
Whitlow ...	2	22	—	24	1
Cellulitis ...	2	73	1	75	6
154. A. Tinea ...	1	18	—	19	3
B. Scabies ...	2	147	—	149	7
155. Other diseases of the skin—Erythema ...	—	2	—	2	—
Urticaria ...	—	4	—	4	—
Eczema ...	1	24	—	25	1
Carried forward	204	4,888	152	5,092	265

TABLE Vb.—Continued.

Diseases.	Remaining at the end of 1932	Admissions during 1933.	Deaths.	Total cases treated.	Remaining at the end of 1932
Brought forward	204	4,888	152	5,092	265
155. Other diseases of the skin, *contd.*					
Herpes ...	—	1	—	1	—
Psoriasis ...	—	3	—	3	—
Elephantiasis ...	—	12	—	12	3
Chigoes ...	1	11	—	12	—
Ulcers ...	30	784	3	814	56
Unclassified ...	2	21	—	23	1
X. *Diseases of the Bones and Organs of Locomotion: (non-tuberculous).*					
156. Diseases of bones:—					
Osteitis ...	—	10	—	10	2
Periostitis ...	—	6	—	6	—
Suppurative osteomyelitis ...	—	11	—	11	4
157. Diseases of joints:—Arthritis ...	1	16	—	17	2
Synovitis ...	1	31	—	32	2
158. Other diseases of bones and organs of locomotion:—					
Lumbago ...	—	30	—	30	2
Muscular rheumatism or myalgia ...	1	52	—	53	3
Fibrositis ...	—	7	—	7	—
Unclassified ...	—	2	—	2	1
XI. *Malformations.*					
159. Hydrocephalus ...	—	1	—	1	—
XII. *Diseases of Infancy.*					
160. Congenital debility ...	—	14	1	14	2
161. Premature birth ...	—	1	—	1	—
163. Infant neglect ...	—	1	—	1	—
XIII. *Affections of Old Age.*					
164. Senility ...	—	3	2	3	—
Senile dementia ...	—	1	—	1	—
XIV. *Affections produced by External Causes.*					
171. Suicide by cutting instruments ...	—	1	1	1	—
175. Food poisoning ...	—	1	1	1	—
176. Attacks of poisonous animals:—					
Snake-bite ...	2	39	1	41	3
Insect-bite ...	1	9	—	10	—
177. Other accidental poisonings ...	—	2	—	2	—
178. Burns (by fire) ...	13	136	16	149	12
179. Burns (other than by fire) ...	—	9	—	9	3
183. Wounds by firearms (war excepted) ...	—	7	1	7	—
184. Wounds (by cutting or stabbing instruments)	16	198	8	214	3
185. Wounds (by fall) ...	6	231	2	237	6
186. Wounds (in mines or quarries) ...	—	1	—	1	—
188. Wounds (by crushing) ...	1	7	1	8	—
189. Injuries inflicted by animals, bites, kicks, etc.	3	83	4	86	4
193. Exposure to cold, frost-bite, etc. ...	—	4	—	4	—
195. Lightning stroke ...	—	8	—	8	—
201. A. Dislocation ...	1	16	—	17	1
B. Sprain ...	2	30	—	32	1
C. Fracture ...	8	83	8	91	12
202. Other external injuries:—					
Bruises ...	1	67	—	68	1
Abrasions ...	—	36	—	36	2
Unclassified ...	1	65	1	66	1
Carried forward	295	6,939	202	7,234	392

Diseases	Remaining at the end of 1932	Admissions during 1933	Deaths	Total Cases Treated	Remaining 1933
Brought forward	295	6,939	202	7,234	392
XV. *Ill-defined Diseases.*					
205. A. Diseases not already specified or ill-defined :—					
Ascites	—	13	6	13	2
Oedema	1	5	—	6	1
Asthenia or debility	—	41	2	41	2
Headache	—	8	—	8	—
Hyperpyrexia	—	1	1	1	—
Pyrexia of unknown origin ...	2	8	—	10	—
Diseases not diagnosed	—	2	—	2	—
Syncope	—	1	—	1	—
B Malingering	—	6	—	6	—
TOTAL ...	298	7,024	211	7,322	397

TABLE VI.

Table VIa.—Return of European Out-Patients, 1932

Diseases.	M.	F.
I. *Epidemic, Endemic and Infectious Diseases:*		
1. Enteric group:—		
(b) Paratyphoid A ...	—	1
(d) Type not defined ...	1	—
3. Relapsing fever	3	1
5. Malaria:—		
(a) Tertian	11	1
(b) Quartan	2	—
(c) Aestivo-autumnal ...	66	23
(e) Blackwater	3	—
Type not defined	61	20
10. Diphtheria	—	1
11. Influenza	23	17
16. Dysentery:—		
(a) Amoebic	20	10
(b) Bacillary	4	3
25. Other epidemic diseases:—		
(a) German measles ...	1	—
31. Tuberculosis, pulmonary and laryngeal	1	1
38. Syphilis:—(a) Primary ...	4	—
(b) Secondary ..	1	—
(c) Tertiary ...	2	—
40A. Gonorrhoea and its complications	16	—
II. *General Diseases not mentioned above:*		
49. Cancer of organs not specified	—	1
50. Tumours non-malignant ..	2	1
51. Acute rheumatism	3	2
52. Chronic rheumatism ...	4	—
57. Diabetes (not including insipidus)	2	—
58. Anaemia:—(a) Pernicious ...	1	—
(b) Other anaemias	—	4
69. Auto-intoxication	2	1
III. *Affections of Nervous System and Organs of the Senses:*		
74. Apoplexy:—(a) Haemorrhage	—	1
75. Paralysis:—(b) Other paralyses	1	—
78. Epilepsy	1	—
82A. Hysteria	2	6
B. Neuritis	11	1
C. Neurasthenia	9	4
D. Neuralgia	—	3
84. Other affections of the nervous system	2	1
85. Affections of the organs of vision:		
(b) Conjunctivitis	17	10
(c) Other affections of the eye	12	6
86. Affections of the ear or mastoid sinus	29	21
IV. *Affections of Circulatory System:*		
87. Pericarditis	—	1
88. Acute endocarditis	—	2
89. Angina pectoris	1	—
Carried forward	318	143

Diseases.	M.	F.
Brought forward	318	143
90. Other diseases of the heart:—		
(a) Valvular	1	2
(b) Myocarditis	1	1
Disordered action ...	1	2
91. Diseases of the arteries:—		
(b) Arterio sclerosis ...	4	—
93. Diseases of the veins:—		
Varicose veins	1	1
Haemorrhoids	9	3
94. Diseases of the lymphatic system:—		
Lymphadenitis (non-specific)	3	3
95. Haemorrhage of undetermined cause	1	—
96. Other affections of the circulatory system	—	1
V. *Affections of the Respiratory System:*		
97. Diseases of the nasal passages:—		
Adenoids	2	—
Rhinitis	8	—
Coryza	41	30
98. Affections of the larynx:		
Laryngitis	4	3
99. Bronchitis:—Acute	10	2
Chronic ...	3	2
101. (b) Pneumonia unclassified ...	1	—
102. Pleurisy	2	—
105. Asthma	2	1
VI. *Diseases of the Digestive System:*		
108. Diseases of the teeth or gums—		
Caries	19	2
Pyorrhoea	1	—
Gingivitis	1	4
B. Other affections of the mouth:—		
Stomatitis	1	—
Glossitis	—	2
Unclassified	1	—
109. Affections of the pharynx or tonsils:—		
Tonsillitis	21	13
Pharyngitis	16	9
111. B. Ulcer of the duodenum ...	2	1
112. Other affections of stomach:—		
Gastritis	12	4
Dyspepsia	22	10
113. Diarrhoea and enteritis:—		
Under two years	23	1
114. Diarrhœa and enteritis:—		
Two years and over ...	14	9
Colitis	4	2
114a. Sprue	1	1
115. Ankylostomiasis	—	1
116. Diseases due to intestinal parasites:—		
Cestoda (Taenia)	1	—
Nematoda (other than ankylostoma):—		
(e) Ascaria	1	—
Oxyuris	1	—
(f) Unclassified ...	1	—
117. Appendicitis	4	1
118. Hernia	1	—
Carried forward	559	254

TABLE VI.—Continued.

Diseases	M.	F.
Brought forward	559	254
119. A. Affections of the anus :—		
Unclassified	1	—
B. Other affections of the intestines	1	—
Constipation	5	—
124. Other affections of the liver :—		
Hepatitis ...	2	1
Cholecystitis	—	1
Jaundice	—	1
VII. *Diseases of the Genito-urinary System : (non-Venereal)*		
129. Chronic nephritis	—	1
131. Other affections of the kidneys :—		
Pyelitis	2	6
132. Urinary calculus	2	—
133. Diseases of the bladder :—		
Cystitis	1	3
135. Diseases of the prostate :—		
Hypertrophy	1	—
Prostatitis	2	—
136. Diseases (non-venereal) of the genital organs of Man :—		
Orchitis	2	—
138. Salpingitis	—	4
139. Uterine tumours (non-malignant)	—	1
140. Uterine haemorrhage (non-puerperal)	—	2
A. Metritis	—	2
B. Other affections of female organs :—		
Displacement of the uterus	—	3
Dysmenorrhoea	—	7
Leucorrhoea	—	2
Menorrhagia	—	1
142. Diseases of the breast (non-puerparal) :—		
Mastitis	—	5
VIII. *Puerperal State* :		
143. A. Normal labour ...	—	11
B. Accidents of pregnancy :—		
(a). Abortion	—	3
(c). Other accidents ...	—	2
145. Other accidents of parturition	—	1
IX. *Affections of the Skin and Cellular Tissues* :		
152. Boil	20	1
Carbuncle	—	1
153. Abscess	13	7
Whitlow	5	4
Cellulitis	5	1
154. A. Tinea	7	3
B. Scabies	2	1
Carried forward	630	329

Diseases.	M.	F.
Brought forward	630	329
155. Other diseases of the skin :—		
Erythema	7	2
Urticaria	4	4
Eczema ...	8	4
Herpes	2	1
Myiasis	1	2
Chigoes	1	—
Ulcer	15	2
Unclassified	19	3
X. *Diseases of Bones and Organs of Locomotion (non-tuberculous)* :		
156. Diseases of bones :—		
Periostitis	2	—
157. Diseases of joints :—		
Synovitis	6	—
158 Other diseases of bones or organs of locomotion :		
Lumbago ...	3	1
Muscular rheumatism or myalgia ...	4	3
Fibrositis	6	—
Tenosynovitis	3	1
Bursitis	1	—
Unclassified	1	—
XIV. *Affections produced by external causes.*		
165. Suicide by poisoning ...	—	1
175. Food poisoning	3	1
176. Attacks by poisoning animals :—		
Insect-bite	2	1
178. Burns (by fire)	3	—
179. Burns (other than by fire) ...	4	1
289. Wounds by fall	10	1
189. Injuries inflicted by animals :— bites, kicks etc.	9	6
201. A. Dislocation	2	—
B. Sprain	16	5
C. Fracture	9	3
202. Other external injuries :—		
Bruises	20	1
Abrasions ...	11	—
Unclassified	1	1
XV. *Ill-defined diseases.*		
Sudden death (cause unknown)	1	1
Asthenia or debility	17	15
Headache ...	1	1
Pyrexia of unknown origin ...	2	1
Observation	—	2
Total .	824	393

TABLE VIB.

RETURN OF DISEASES (NATIVE OUT-PATIENTS) FOR THE YEAR 1933.

Diseases.	Hospital Out-Patients		Rural Dispensaries.	
	Males	Females	Males	Females
I. *Epidemic, Endemic and Infectious Diseases*				
1. Enteric group—(a) Typhoid ...	5	—	—	—
(b) Paratyphoid A. ...	2	—	—	—
(c) „ B. ...	1	—	—	—
(d) Undefined ...	—	2	—	—
3. Relapsing fever	129	58	22	3
5. Malaria—(a) Tertian	717	405	—	—
(b) Quartan	39	30	—	—
(c) Aestivo-autumnal ...	630	234	—	—
(d) Cachexia	39	22	—	—
(e) Blackwater ...	4	1	—	—
Type not defined	1,374	759	3,440	1,914
6. Smallpox	111	42	6	20
Alastrim	52	26	—	—
7. Measles	6	10	18	2
9. Whooping cough	304	320	595	428
11. Influenza	1,333	971	804	513
13. Mumps	13	6	—	—
15. Epidemic diarrhoea	8	21	—	—
16. Dysentery—(a) Amoebic ...	144	66	—	—
(b) Bacillary ...	7	4	—	—
(c) Undefined	75	22	777	560
20. Leprosy	100	23	29	9
24. Epidemic cerebro-spinal fever ...	10	2	—	—
25. Other epidemic diseases—				
(a) Chickenpox	16	9	—	—
(g) Yaws	313	240	767	646
(h) Trypanosomiasis	25	7	—	—
29. Tetanus	2	1	—	—
30. Mycosis	1	—	—	—
31. Tuberculosis, pulmonary and laryngeal ...	38	28	—	—
33. Tuberculosis of the intestines or peritoneum	—	1	—	—
34. Tuberculosis of the vertebral column ...	3	—	—	—
35. Tuberculosis of bones and joints ...	5	3	—	—
36. Tuberculosis of other organs—				
(a) Skin	5	6	—	—
(c) Lymphatic system ...	8	4	—	—
37. Tuberculosis disseminated—				
(b) Chronic	1	—	—	—
Tuberculosis unclassified ...	—	—	11	4
38. Syphilis—(a) Primary	213	112	—	—
(b) Secondary ...	160	156	—	—
(c) Tertiary	73	52	—	—
(d) Hereditary ...	44	23	—	—
(e) Period undefined ...	5	8	344	186
39. Soft Chancre	3	—	—	—
40. A. Gonorrhoea and its complications ...	271	52	340	165
(b) Gonorrhoeal Ophthalmia ...	5	16	—	—
(c) „ Arthritis ..	4	11	—	—
41. Septicaemia	2	—	—	—
42. Other infectious diseases ...	1	—	2,533	1,391
II. *General Diseases, not mentioned above.*				
44. Cancer of the stomach ...	2	—	—	—
„ „ „ liver	3	2	—	—
45. „ „ „ intestines ...	1	—	—	—
46. „ „ „ female genital organs ...	—	2	—	—
47. „ „ „ breast	—	3	—	—
49. „ not classified	3	1	3	1
50. Tumours non-malignant	57	29	86	35
Carried forward	6,367	3,790	9,775	5,877

TABLE VIB.—Continued.

Diseases.	Hospitals. Out-Patients Males	Hospitals. Out-Patients Females	Rural Dispensaries. Males	Rural Dispensaries. Females
Brought forward	6,367	3,790	9,775	5,877
51. Acute rheumatism	273	174	—	—
52. Chronic rheumatism	949	411	3,682	2,471
53. Scurvy	39	24	45	24
54. Pellagra	5	3	—	—
55. Beri Beri ...	2	—	—	—
56. Rickets	4	—	—	—
57. Diabetes	1	—	—	—
58. Anaemia—(a) Pernicious ...	2	2	—	—
(b) Other anaemias ...	51	29	86	29
59. Diseases of the pituitary body ...	1	—	—	—
60. Diseases of the thyroid gland—				
(a) Exophthalmic goitre ...	2	1	—	—
(b) Others	2	—	—	—
61. Diseases of the parathyroid gland ...	1	—	—	—
64. Diseases of the spleen ...	30	10	9	13
65. Leukaemia	1	3	—	—
66. Alcoholism	2	—	—	—
Other general diseases unclassified ...	—	—	29	29
III. *Affections of Nervous System and Organs of the Senses.*				
73. Other affections of the spinal cord ...	—	1	—	—
74. Apoplexy—				
(c) Thrombosis	—	1	—	—
75. Paralysis—(a) hemiplegia ...	9	1	—	—
(b) Other paralyses ...	5	5	—	—
77. Other forms of mental alienation ...	3	1	—	—
Melancholia	1	—	—	—
78. Epilepsy	57	8	—	—
80. Infantile convulsions	2	12	—	—
81. Chorea	1	—	—	—
82. A. Hysteria	—	4	—	—
B. Neuritis	83	28	—	—
C. Neurasthenia	3	—	—	—
D. Neuralgia	247	107	—	—
83. Cerebral softening	7	—	—	—
84. Other affections of the nervous system—				
(unclassified)	—	3	419	195
85. Affections of the organs of vision—				
(b) Conjunctivitis	3,596	3,568	—	—
(c) Trachoma	27	23	—	—
(d) Tumours of the eye ..	1	1	—	—
(e) Other affections of the eye ...	178	71	9,145	8,905
86. Affections of the ear and mastoid sinus	1,494	896	2,750	2,054
Cerumen	46	10	—	—
IV. *Affections of the Circulatory System.*				
87. Pericarditis	3	4	—	—
90. Other diseases of the heart—				
(a). Valvular	62	40	—	—
(b). Myocarditis	3	3	—	—
(c). Disordered action ...	20	9	101	79
Unclassified	—	—	17	13
91. Diseases of the arteries—				
(a). Aneurism	1	1	—	—
(b). Arterio-sclerosis	2	—	—	—
Others	3	5	—	—
92. Embolism (non-cerebral) ...	1	—	—	—
93. Diseases of the veins—				
Varicose veins	8	3	—	—
Haemorrhoids	11	3	—	—
Phlebitis	5	3	—	—
Carried forward	13,611	9,258	26,058	19,689

TABLE VIB.—Continued.

Diseases.	Hospital Out-Patients		Rural Dispensaries	
	Males	Females	Males	Females
Brought forward ...	13,611	9,258	26,058	19,689
94. Diseases of the lymyhatic system—				
Lymphangitis	46	25	—	—
Lymphadenitis (non-specific) ...	45	25	—	—
V. *Affections of Respiratory System.*				
97. Diseases of nasal the passages—				
Adenoids	1	19	—	—
Polypus	4	—	—	—
Rhinitis ...	32	3	—	—
Coryza	1,167	453	2,533	1,012
Unclassified	—	—	97	63
98. Affections of the larynx—				
Laryngitis	77	—	96	48
99. Bronchitis—(a) Acute ...	5,749	2,990	15,233	8,942
(b) Chronic ...	1,747	1,430	—	—
100. Broncho-pneumonia	65	42	—	—
101. (a) Pneumonia—lobar ...	47	31	—	—
(b) Unclassified.	30	6	692	430
102. Pleurisy	71	28	69	43
Empyema	1	—	—	—
105. Asthma	132	31	216	140
107. Other affections of the lungs ...	6	—	—	—
VI. *Diseases of the Digestive System*:				
108. A. Diseases of the teeth or gums—				
Caries	1,940	1,246	2,819	1,763
Pyorrhoea	188	101	101	121
Gingivitis	78	54	99	75
B. Other affections of the mouth—				
Stomatitis ...	311	184	392	583
Glossitis	5	1	—	—
Unclassified	1	—	—	—
109. Affections of the pharynx and tonsils—				
Tonsillitis	435	205	650	411
Pharyngitis	688	362	70	42
112. Other affections of the stomach—				
Gastritis	161	80	—	—
Dyspepsia	705	322	2,181	818
Unclassified	2	2	—	—
113. Diarrhoea and enteritis—				
Under two years	562	429	} 5,626	3,549
114. Diarrhoea and enteritis, two years and over	688	343		
Colitis	192	83	—	—
Ulceration	—	2	—	—
Intestinal colic	27	19	—	—
115. Ankylostomiasis	5,097	4,621	2,687	1,663
116. Diseases due to intestinal parasites—				
(a) Cestoda (Taenia) ...	18	11	—	—
(c) Nematoda (other than ankylostoma)				
Ascaris	898	453	—	—
Oxyuris	6	5	—	—
(f) Unclassified	1	—	153	71
118. Hernia	21	2	49	30
119. A. Affections of the anus—				
Fistula	7	2	—	—
B. Other affections of the intestines ...	2	—	—	—
Constipation	5,499	2,595	12,111	5,873
122. Cirrhosis of the liver—(a) Alcoholic ...	1	1	—	—
(b) Other forms...	3	—	—	—
124. Other affections of the liver—Abscess ...	4	4	—	—
Hepatitis ...	6	4	—	—
Jaundice ...	15	11	—	—
Carried forward	40,392	25,483	71,932	45,366

TABLE VIB.—Continued.

Diseases.	Hospitals. Out-Patients Males	Hospitals. Out-Patients Females	Rural Dispensaries. Males	Rural Dispensaries. Females
Brought forward	40,392	25,483	71,932	45,366
126. Peritonitis (of unknown cause) ...	1	—	—	—
VII. *Diseases of the Genito-urinary System.*				
128. Acute nephritis	11	21	—	—
129. Chronic nephritis	4	2	—	—
130. *B. Schistosomiasis*	1,933	492	1,812	794
131. Other affections of the kidneys—				
Pyelitis	2	1	—	—
Unclassified	—	—	3	1
132. Urinary calculus	1	—	—	—
133. Diseases of the bladder—Cystitis ...	32	19	28	7
Unclassified ...	2	1	—	—
134. Diseases of the urethra—				
Stricture	20	—	—	—
Unclassified	7	2	1	—
136. Diseases (non-venereal) of the genital organs of man—Epididymitis ...	4	—	—	—
Orchitis ...	30	—	—	—
Hydrocele ...	44	—	—	—
Ulcer of penis ...	6	—	—	—
Unclassified ...	10	—	4	—
138. Salpingitis	—	5	—	—
Abscess of the pelvis	—	2	—	—
139. Uterine tumour (non-malignant) ...	—	3	—	—
140. Uterine haemorrhage—(non-puerperal) ...	—	3	—	—
141. A. Metritis	—	11	—	—
B. Other affections of female genital organs.				
Displacement of the uterus ...	—	1	—	—
Amenorrhoea	—	3	—	—
Dysmenorrhoea	—	15	—	—
Leucorrhoea	—	5	—	—
Unclassified	—	2	—	17
142. Diseases of the breast (non-puerperal).				
Mastitis	—	30	—	—
Abscess of breast	—	50	—	—
Unclassified	—	1	—	—
VIII. *Puerperal State.*				
143. A. Normal labour	—	43	—	9
B. Accidents of pregnancy—				
(a) Abortion	—	23	—	1
(b) Other accidents	—	5	—	11
144. Puerperal haemorrhage	—	1	—	—
145. Other accidents of parturition ...	—	25	—	—
146. Puerperal septicaemia	—	9	—	—
150. Puerperal affections of the breast .	—	5	—	—
IX. *Affections of the Skin and Cellular Tissue.*				
151. Gangrene	4	5	—	—
152. Boil	350	117	2,409	1,828
Carbuncle	6	3	—	—
153. Abscess	482	285	—	—
Whitlow	210	86	—	—
Cellulitis	190	50	69	59
154. A. Tinea	247	158	167	77
B. Scabies	4,971	1,865	9,342	4,547
Carried forward	48,959	28,832	85,767	52,717

TABLE VIB.—Continued.

Diseases.	Hospital Out-Patients		Rural Dispensaries	
	Males	Females	Males	Females
Brought forward	48,959	28,832	85,767	52,717
155. Other diseases of the skin—				
Erythema	11	8	—	—
Urticaria	48	24	—	—
Eczema	1,381	1,020	—	—
Herpes	41	24	—	—
Psoriasis	35	27	—	—
Elephantiasis	29	2	—	—
Chigoes	368	195	160	89
Ulcer	7,410	3,389	19,034	11,972
Unclassified	464	199	3,796	2,872
X. *Diseases of Bones and Organs of Locomotion*:				
156. Diseases of bones—				
Osteitis	7	7	—	—
Periostitis	13	3	—	—
Suppurative osteomyelitis ...	7	3	—	—
157. Diseases of joints—				
Arthritis	29	21	—	—
Synovitis	201	46	225	119
158. Other diseases of bones or organs of locomotion—				
Lumbago	519	113	1,985	789
Muscular rheumatism or myalgia ...	1,385	589		
Fibrositis	28	15	—	—
Tenosynovitis	6	—	—	—
Unclassified	8	4	—	—
XI *Malformations*:				
159. Hydrocephalus	3	—	—	—
Hypospadias	1	—	—	—
XII. *Diseases of Infancy*:				
160. Congenital debility ...	30	22	—	—
161. Premature birth	—	6	—	—
162. Other affections of infancy ...	2	1	—	—
163. Infant neglect	1	1	—	—
XIII. *Affections of Old Age*:				
164. Senility	15	—	—	—
Senile dementia	3	—	—	—
XIV. *Affections produced by External Causes*:				
171. Suicide by cutting instruments ...	1	2	—	—
172. Suicide by jumping from a height ...	1	—	—	—
175. Food poisoning	21	—	—	—
176. Attacks of poisonous animals—				
Snake-bite	25	13	—	—
Insect-bites	74	34	—	—
177. Other accidental poisonings ...	4	5	5	7
178. Burns (by fire)	711	474	2,980	2,184
179. Burns (other than by fire) ...	22	13		
183. Wounds by firearms (war excepted) ...	7	3	—	—
184. Wounds (by cutting instruments) ...	2,961	522	—	—
185. Wounds (by fall)	4,097	1,206	—	—
186. Wounds (in mines or quarries) ...	19	—	—	—
187. Wounds (by machinery) ...	2	—	—	—
188. Wounds (by crushing)	88	9	—	—
189. Injuries inflicted by animals bites, kicks, etc.	330	64	913	537
192. A. Over-fatigue	1	—	—	—
Carried forward	69,368	36,896	114,865	71,286

TABLE VIB. Continued.

Diseases.	Hospital Out-Patients		Rural Dispensaries	
	Males	Females	Males	Females
Brought forward	69,368	36,896	114,865	71,286
193. Exposure to cold etc.	2	2	—	—
195. Lightning stroke	—	—	7	8
198. Murder by cutting instruments ...	1	1	—	—
201. A. Dislocation	24	3	—	—
B. Sprain	219	46	—	—
C. Fracture	50	19	95	41
Other external injuries—Bruises ...	404	146	—	—
Abrasions ...	680	120	—	—
Foreign body ...	—	4	—	—
Unclassified ...	2,365	1,100	32,983	11,601
XV. *Ill-defined Diseases*:				
205. A. Diseases not already specified or ill-defined.				
Ascites	4	—	—	—
Oedema	9	6	—	—
Asthenia or debility	75	17	—	—
Headache	1,625	530	—	—
Pyrexia of unknown origin ...	20	10	—	—
Diseases not diagnosed ...	28	5	—	—
Unclassified	—	—	5,255	2,199
B. Malingering	7	1	—	—
TOTAL ...	74,881	38,906	153,205	85,135

THE ANNUAL REPORT OF THE MEDICAL ENTOMOLOGIST FOR 1933.

This report refers to the work of the first five and a half months of the year only, since I went on leave in late June.

2. *Tsetse fly control in the Northern Province.* I carried out a fly reconnaissance in the Dowa and Fort Manning Districts in May, my last survey having taken place in October of the previous year.

In the former district I did not succeed in obtaining a single fly south of the former tsetse-control line. In the latter, however, I caught a few at the north end of the Nyumbu Dambo where they have now existed for several years but seem neither to have increased in numbers nor to have spread, and one or two to the west of Kamanges where also they are usually to be found. I found none in the Kamwendo thicket which was invaded early in 1932, when measures were taken to evict them, nor did I take any along the Lilongwe-Fort Manning road, nor to the south of it, though the bush thereabouts in which several thickets occur would seem to be particularly suitable for them.

The position seemed to be satisfactory, therefore.

3. I continued the investigation of the possibility that arthropods other than *Glossina* are vectors of trypanosomes, studying the question of transmission by certain non-biting haematophagous flies—*Musca spectanda*, Wied:, *M. tempestiva*, Flu, and by another species as yet undetermined—and by a biting species *Bdellolarynx latifrons*, Mall, in particular. I carried out a little experimental work similarly with *Lyperosia potans*, Bezz:, but had difficulty in obtaining a sufficiency to enable me to come to any conclusions concerning it.

I tested the non-biting flies in regard to *T. brucei* and *T. congolense* but since I had no type specimens at the time (a matter which has now been partly remedied) and the insects resemble each other rather closely I am unable to state the relative numbers of the species employed.

4. The following paragraphs summarize the experimental work:—

a. Muscids that had fed to repletion on an ox on a day when there was an average of 30 *T. brucei* to 100 leucocytes in its peripheral blood were allowed to feed at a small incision in the tail of a rat, eight after an interval of 5 days, eight after an interval of 8 days, five on the 11th day, four on the 13th, three on the 16th, and three on the 28th day. The animal was alive and well three months later.

b. Muscids that had fed to repletion on the blood of the same ox on the same occasion were allowed to feed at a small incision in the margin of the ear of a guineapig, three 17 days later, three 19 days, three 21 days, two 23 days and two 25 days later. The animal was in good health when I went on leave but died subsequently from causes undetermined.

c. A muscid that had fed to repletion on the blood of the same ox on the same occasion was allowed to feed similarly on the serous exudation from a sore on another guineapig, on the 27th, 28th, 32nd and 33 days. This animal, again, remained in good condition up to the 67th day when I went on leave but died subsequently.

d. Muscids that had fed to repletion on the blood of an ox on a day when there were 60 *T. congolense* to 100 leucocytes in its blood, and a few larger trypanosomes of the same type which I took to be *T. simiae*, were allowed to feed at the tip of the tail of a rat, five on the 6th day, three on the 8th. The animal was well 78 days later.

e. Muscids that had fed to repletion on the blood of the same ox on the same occasion were allowed to feed on serum exuding from a sore on a guineapig, six 13 days later, four 14 days, two 18 days, and three 19 days later. The animal was in good condition up to sixty-six days later.

f. Muscids that had fed to repletion on the same ox on the same occasion were allowed to feed on the exudations from a sore on the ear of a pup, one 15 days, one 21 days, and three 23 days later. The animal has remained in good health.

g. Muscids that had fed to repletion on the blood of an ox in which there was an average of 100 *T. congolense* to 50 leucocytes were allowed to feed on the exudations from a sore on a guineapig, four 6 days later, six 8 days, and 3 twelve days later. The animal was well up to 73 days later, a rat subinoculated hypodermically as a control from the trypanosome carrier dying on the 35th day.

h. A muscid that had fed to repletion on the blood of the same ox was allowed to suck up exudations from a sore on the ear of a pup, on the 15th, 17th, 20th, 26th, 27th, 30th, and 34th days subsequent and the same fly was allowed to feed further on a sore on the ear of a second pup, on the 24th, 35th, 39th and 44th days subsequent. Both animals have remained in good health.

i. Muscids that had fed on the blood of an ox having 15 *T. brucei* and *2 T. congolense* to 100 leucocytes were subsequently allowed to suck up exudations resulting from the removal of a scab from an old sore on a guineapig, one on the 4th day, 3 on the 5th, two on the 6th, three on the 10th, one on the 24th, six on the 25th, one on the 26th, one on the 27th, two on the 31st, and one on the 34th days, and other flies in the same set were allowed to feed further on material exuding from a sore made by a pup on its ear in its efforts to dislodge ticks, two on the 14th day three on the 15th, three on the 17th, and one on the 24th day subsequent. The guineapig was in good condition 44 days later, and the pup duly attained maturity.

j. Another set of the muscids that had fed on the blood of the ox on the same occasion were allowed to suck at the sore on another pup, one on the 18th day, two on the 22nd, one on the 26th, two on the 38th and one on the 42nd day. This animal, also, showed no signs of infection subsequently.

k. Muscids that had fed been replete on the blood of an ox in which there were 10 *T. congolense* to 100 leucocytes were allowed to feed at a sore on the ear of a pup, six on the 3rd day, seven on the 5th, two on the 6th, 2 on the 7th, one on the 9th, two on the 10th, three on the 12th, seven on the 14th, four on the 16th, nine on the 17th, five on the 19th, four on the 23rd, four on the 25th, two on the 31st, one on the 33rd, and three on the 34th days subsequently. The animal is in good condition nine months later.

l. Muscids that had fed on the same occasion on the blood of the same ox were allowed to feed at a sore on the ear of a second pup, one on the 9th day, two on the 10th, six on the 12th, seven on the 16th, 5 on the 25th, six on the 28th, and two on the 34th days. This animal also is in good condition, now seven months from the termination of the experiment.

m. Muscids that had fed on the same occasion were allowed to feed on the blood of a rat, two on the 9th and two on the 21st days. The animal was apparently well sixty-four days from the last meal made by the insects.

n. Muscids that had fed on the same occasion were allowed to make a further meal on the blood of a second rat 9 days later. This also was alive and in apparent health sixty-one days later.

o. A further series of the same muscids that had fed on the same occasion were allowed to feed on the blood of a third rat, two on the 3rd day and two on the 9th. This rat, also, was in good condition sixty-one days later

p. A further series of the same muscids that had fed on the infected animal were allowed to feed on a fourth rat, three on the 3rd day, and two on the 9th. This also was in good condition when I went on leave sixty-one days later.

5. A second series of experiments designed to ascertain if these muscids are responsible for the *direct* transmission of the trypanosome was then carried out.

a. Three of the flies that had been feeding on the blood of an ox in which there were 5 *T. brucei* and 4 *T. congolense* to 100 leucocytes and were considered as being about ¼ replete were allowed to finish their meal on a rat two minutes later. This animal was in good health 67 days later, though a control rat which was subinoculated hypodermically died with a heavy infection of *T. brucei* on the 41st day.

b. A further series of three of the same flies were allowed two minutes after a partial meal on the blood of an ox to complete it on another rat. This, also, was well up to the 61st day afterwards.

c. A further series of six flies were allowed, five minutes after they had taken some blood of the ox to feed to repletion on a third rat which, also, was healthy up to the 61st day.

d. A still further series of three of the flies were allowed, five minutes after a similar initial feed, to complete their meal on a fourth rat, which, also, was healthy on the 61st day.

e. Two muscids that had become partly replete on the blood of a rat moribund with an infection of *T. brucei*, 30 to 10 leucocytes, were allowed two minutes later to complete their meal on a second animal, which was in good condition 35 days later

The two sets of experiments now recorded would seem to show, therefore, that these muscids are not responsible either for the cyclical or for the direct transmission of the trypanosomes dealt with, but I propose to study the question more fully, the data brought forward being too meagre to warrant any really definite conclusions.

6. For the work with the *Bdellolarynx* it was necessary to carry out some preliminary investigations with a view to ascertaining their biting habits, and how best to keep them alive in captivity, and I eventually tabulated data relating in the former respect to 50 of the insects (36 males and 14 females).

I quote some of these, since they show that the fly is probably sufficiently long-lived even in captivity for the development of trypanosomes within it and since they bring out the voracity of both sexes, which is unequalled in my experience by any other biting fly, except *Glossina* and possibly *Stomoxys* (tabanidae feeding on blood three or four times only as a rule in the course of their lives) a habit which adds immens ly of course to their potentialities as carriers of disease-producing organisms.

Of the males two lived 10 days in captivity, five 11 days, six 12 days, four 13 days, six 14 days, one 15 days, one 16 days, one 17 days, one 18 days, one 19 days, one 20 days, two 21 days, two 23 days two 24 days and one 25 days. Of the females two lived 10 days, two 11 days, one 12 days, one 13 days, one 14, two 15, two 16, two 17, two 18, two 19, one 27 and one 29 days.

As to biting habit I ascertained that during the first five or six days after capture the insects, both males and females, would often feed on blood daily to entire repletion, thereafter taking it at less frequent intervals, every few days only, and that a fly refusing to bite in the early morning would often do so by midday or in the late afternoon. One of the males that survived for 24 days fed for instance on a pup daily for 6 days, refused on the 7th, but fed on the 8th day, refused on the 9th but fed on the 10th, refused on the 11th, 12th and 13th days but fed on the 14th, on a rat, refused on the 15th and 16th, but again fed on the rat on the 17th and 18th days, refused on the 19th but fed on the 20th, again on the rat, refused both dog and rat on the four days following and died. The female that lived 29 days was captured replete on the blood of an ox, refused to bite a dog on the 2nd and 3rd days but fed daily on the animal from the 4th to the 8th days, refused to bite an ox on the 9th day but fed again on the dog on the 10th, again refused to bite either animal on the 11th and 12th days, but fed on a dog on the 13th and 14th days. It again refused to bite on the 15th and 16th days but fed on a rat daily from the 17th to the 20th days, refused to bite a dog on the 21st day, but fed on it on the day following, refused to bite the animal on the 23rd day, but fed on it again on the 24th, taking blood from a rat on the 25th and 26th days also. It refused the dog on the 27th, and the rat on the 28th and 29th days, dying on the 30th.

7. With these flies I undertook the following experiments, which, however, were not carried far enough, by reason of my departure on leave, to be conclusive.

a Flies that had fed on an ox having 30 *T. brucei* to 100 leucocytes were allowed to bite a rat, two 24 hours later, one 2 days later, three 4 days, four 5 days, two 7 days, three 9 days, one 11 days and one 12 days later. The animal was in good condition 85 days later.

b. Flies that had fed on an ox having 20 *T. congolense* to 100 leucocytes were allowed to bite a rat, one on the 3rd day, two on the 4th, one on the 5th, three on the 6th, three on the 8th, one on the 9th, three on the 11th, one on the 14th and one on the 15th days. The animal was in good condition 79 days later.

8. I attended in the course of my leave the Conference on Tsetse and Trypanosomiasis (Animal and Human) Research held at Entebbe from the 22nd to the 25th November, and that on Medical Problems held at the same place from the 27th to the 29th.

W. A. Lamborn,
Medical Entomologist.

ANNUAL REPORT OF THE LABORATORY SECTION FOR 1933.

PART I.

(A) General Review of the year.

A total number of three thousand specimens were examined which is a very marked increase over the total for the previous year, it is further an indication that the value of laboratory investigation is becoming more appreciated by local practitioners of medicine.

The inquiry commenced last year concerning the incidence of *Trypanosoma lewisi* in the blood of local rats has been continued, and this investigation receives added stimulus now it is known that it is possible for a human subject to become infected with the parasite.

The Cronin Lowe modification of the Bendien Test for the diagnosis of malignancy has been introduced into the routine work. Results so far have been interesting and encouraging, but it too early to give any definite opinion concerning the accuracy of the test.

Samples of drinking water from various townships have been examined, and the results tabulated and embodied in this report for convenience of reference.

The absence of a suitable building for the accommodation of laboratory animals is a source of much difficulty and an obstacle to accurate experimentation. I trust that in the near future it will be possible for this deficiency to be suitably remedied.

(B) Staff.

The staff consists of myself and two African assistants. One of the latter possesses a high degree of ability, and without his aid it would be very difficult to complete the daily routine. Specimens from Africans are first examined by my assistant, who on discovering any parasite or other abnormality requests my confirmation.

Specimens from Europeans are examined by me as soon after arrival as possible, and reports are sent out at once.

(C) Stations from which specimens were received.

237 specimens were received from stations other than Zomba, and of these 47 were from missions. The actual figures are as follows:—

Mlanje	8	specimens.
Fort Manning	2	,,
Lilongwe	7	,,
Port Herald	4	,,
Karonga	1	,,
Dowa	1	,,
Cholo	78	,,
Fort Johnston	60	,,
Dedza	17	,,
Blantyre	12	,,
Missions	47	,,
Zomba	2,754	,,

(D) Financial value of the work accomplished.

A request was made to me that I should submit an estimate of the financial value of the work undertaken for the purpose of proving whether or not it would be any saving to the Government to close the laboratory and to send pathological material elsewhere.

Apart from the fact that most of the work done here could not be conducted with satisfaction elsewhere, owing to the deterioration of certain specimens during transit, the enormous financial saving will be apparent from the undermentioned figures.

The cost of the various examinations has been arranged according to the tariff of fees issued by one of the leading routine laboratories in South Africa, postal charges are not included.

	£	s.	d.
Blood smears. 741 @ 10s. each	370	10	0
Sachs-Georgi tests. 229 @ £1. each.	229	0	0
Total blood counts. 15 @ £1. each	15	0	0
Differential counts. 15 @ 10s. each	7	10	0
Arneth counts. 2 @ 10s. each	1	0	0
Hb. estimations. 14 @ 10s. each	7	0	0
Blood cultures. 2 @ £1. each	2	0	0
Blood sugars. 3 @ £1 each	3	0	0
Blood grouping. 15 @ 10s. each	7	10	0
Widal tests. 18 @ £1.	18	0	0
Bendien tests. 7 @ £2. each	14	0	0
Urine exams. 318 @ 10s. each	159	0	0
Sputum exams. 62 @ 10s. each	31	0	0
Faeces. 577 @ 10s. each	288	10	0
Pus smears. 33 @ 10s.	16	10	0
Urethra smears. 34 @ 10s.	17	0	0
Smears from penile sores 25 @ 10s.	12	10	0
Examinations of synovial fluid. 7 @ 10s.	3	10	0
Examination of cerebro-spinal fluid. 3 @ £1.	3	0	0
Smears for M. leprae. 15 @ 10s.	7	10	0
Gastric analyses. 2 @ £1.	2	0	0
Throat swobs. 19 @ 10s.	9	10	0
Autogenous vaccines. 17 @ £2.	34	0	0
Medico-legal. 471 tests @ £1.	471	0	0
Water analyses. 24 @ £2.	48	0	0
Tissues. 33 @ £1.	33	0	0
TOTAL	£1,810	10	0

PART II.

(A) *Malaria.* 484 blood smears were examined of which number 112 were found to to contain parasites. Included in the specimens were 150 films made from the peripheral blood of African children resident in Zomba.

Plasmodium falciparum. (Welch, 1897).	22.
,, *vivax.* (Grassi and Feletti, 1890)	84.
,, *malariae.*	2.
Mixed infections of *P. falciparum* and *P. vivax.*	4.

Gametocytes were found in 5 cases infected with *P. falciparum*, and in 2 cases infected with *P. vivax.* Pigmented large mononuclear leucocytes were found present in 5 specimens.

(B) *Agglutinations.* Formalised broth cultures were used in making the tests. Positive results occurred in two cases only :—

Paratyphosus A. Patient an African male resident at Mlange.

Paratyphosus B. Patient was a European female resident at Zomba.

(C) *Sach-Georgi test for syphilis.* 229 tests were performed with 118 positive results, viz :—

European males 7, Asiatic males 1, African males 86, African females 24.

(D) *Cronin Lowe modification* of the *Bendien test for the diagnosis* of *malignant disease.* Seven tests were conducted. Each practitioner sent two sera distinguished by the letters A and B, one serum from a normal person and one from the suspect; no clinical details were supplied until after the report on the test had been submitted to the doctor concerned.

The results of the test were correct in all the cases but one, this being a false positive given by serum from a patient who was suffering from advanced sepsis.

(E) *Trypanosomiasis.* Blood smears from an African male, a resident of the South Nyasa district were found to contain polymorphic trypanosomes in large numbers.

Unfortunately, the subject absconded from hospital before any blood could be obtained for inoculation into experimental animals.

(F) *Trypanosoma lewisi.* Blood smears from 256 Zomba rats were examined for the presence of this organism. Dividing forms of the parasite were not observed, in fact they have only been once seen during 670 separate examinations.

(G) *Blood Transfusions.* Three transfusions were given during the year to European patients suffering from blackwater fever.

Members of the community in Zomba have been grouped for the purpose of supplying donors, and it is hoped that during next year it will be possible to group volunteers residing in other populated areas of the Protectorate.

PART III.

Urine examinations. A haemolytic substance was found present in the urine of a patient suffering from blackwater fever.

PART IV.

Tissues. A tumour of the urinary bladder the size of a tennis ball, was removed from an adult African male. On section it was found to consist of practically a solid mass of *Schistosoma haematobium* ova. No malignant change was observed.

PART V.

Autopsies. (1) Adult African male aged 46 years. Death caused by a pneumococcal meningitis.

(2) Adult African female. Dath ecaused by suicidal hanging.

(3) Adult African female. Death due to a stab wound of the abdomen.

(4) Adult African female. Death caused by multiple axe wounds.

(5) Adult European female. Death due to veronal poisoning.

(6) Adult African female. Extensive extradural haemorrhage over right cerebral hemisphere.

(7) Adult African female. Death due to an intradural cerebral haemorrhage.

(8) Adult St. Helena woman. Death caused by asphxiation due to smothering.

Water analyses. The following water supplies were examined during the year :—

Blantyre, Zomba, Lilongwe and Fort Johnston.

SUGGESTIONS.

(1) An animal house is urgently required.

(2) The employment of a capable clerk who could type would enable me to devote more time to scientific work. An average of fifteen to twenty letters per day are sent out from this office excluding reports, etc.

(3) Urgent repairs are required to the building. Rain enters through the roof with great ease and causes much inconvenience and discomfort.

SPECIAL INVESTIGATIONS.

The influence of quinine on the fragility of the erythrocytes.

Experiments were carried out on twenty subjects to ascertain whether or not, quinine has any influence on the fragility of the red cells.

The tests were conducted as follows :—

A row of small test tubes, (3" x $\frac{3}{8}$"), containing various concentrations of saline solution were placed in the undermentioned order, viz :—

	Tube 1.	Tube 2.	Tube 3.	Tube 4.	Tube 5.	Tube 6.	Tube 7.
c.c. of 1% saline ...	0.6	0.7	0.8	0.9	1	1.1	1.2
c.c. of water ...	1.4	1.3	1.2	1.1	1	0.9	0.8
Resulting saline content in%	0.3	0.35	0.	0.45	0.5	0.55	0.6

The 1% saline solution was standardised for me by Dr. I. Armstrong Black, Analytical Chemist to the Agricultural Department.

The blood was obtained by a deep finger prick, the drops being sucked into a hypodermic syringe, then one drop from the syringe tip was delivered into each tube, which was then shaken.

Readings were taken after three hours and again after twelve hours. The fragility of the blood of each subject was tested previous to the administration of any quinine, then after he had received a total of thirty grains of the bi-hydrochloride within a period of twenty-four hours his fragility was again tested. His urine was also examined to make certain that the drug had been absorbed.

The results obtained were of sufficient interest to warrant further investigation, and therefore certain of them are detailed herewith.

	Tube 1.	Tube 2.	Tube 3.	Tube 4.	Tube 5.	Tube 6.	Tube 7.
Normal	CH.	CH.	PH.	SH.			
1st. subject after quinine	CH.	CH.	PH.	PH.	SH.		
2nd. subject	CH.	CH.	PH.	SH.	SH.		
3rd. subject	CH.	CH.	PH.	PH.	SH.		
4th. subject	CH.	CH.	PH.	PH.	SH.	SH.	
5th. subject	CH.	CH.	PH.	PH.	SH.		

CH.=Complete haemolysis.
PH.=Partial haemolysis.
SH.=Slight haemolysis.

Actually in twelve out of the twenty subjects tested, the fragility appeared to be increased, but it is unwise to give any dogmatic opinion until many more cases have been investigated. The results so far however, do appear to indicate that quinine does influence red cell fragility in certain subjects.

A Report on the parasitic contents of ova in one thousand faecal specimens, examined during the period 1932-33.

Introduction. A survey of the stools of 279 European and 844 Africans was undertaken for the purpose of estimating the incidence of intestinal parasitisation, and the relative proportions of the various helminths and protozoa discovered.

All the samples were obtained from people resident in the township of Zomba, many of whom were in-patients of the local hospital, though but few of them were suffering from any disease caused by intestinal parasites.

Zomba is situated at an altitude of about 3,000 feet above sea-level. It lies at the foot of a mountain, so that fast flowing streams are a characteristic of the area. There are two well-marked seasons in the year, viz : a cool dry period extending from May to October, and a hot humid period coinciding with the rains from November to April.

The method employed for the disposal of human excreta is by burial of the matter in a series of deep pit latrines.

Each house is supplied with a suitable iron receptacle which is emptied once daily into a neighbouring pit. Public latrines of the same type are used by the Africans.

Population. The population of the township is composed approximately as follows :— Europeans 250. Asiatics 150. Africans 2,800.

Technique of the Routine Examination. Most of the faecal samples were collected in suitable glass receptacles provided with a spoon. Instructions were given to each subject not to void urine on the specimen, and to take particular care to include any blood or mucus observed in the sample.

On arrival at the laboratory each specimen was thoroughly emulsified in normal saline solution, roughly three parts of saline to one part of faeces being the concentration desired. Two slides were then prepared, one of the saline faecal emulsion, and one specimen stained with double strength Gram's iodine solution If examination of the two slides proved negative, then two further preparations were made and examined, thus before entering a negative result four specimens were always observed. Owing to lack of time, no special method of concentrating the faeces other than the above was adopted.

Summary of Findings. (A) Africans. Total number of specimens examined 846.

Parasite.	Males	Females	Percentage Infested
Schistosoma mansoni	12 ...	— ...	1.4
Schistosoma haematobium ...	2 ...	— ...	0.2
Hookworm	216 ...	12 ...	32.2
Trichuris trichiura	6 ...	— ...	0.6
Ascaris lumbricoides	27 ...	2 ...	3.4
Strongyloides	18 ...	— ...	2.1
Enterobius vermicularis ...	4 ...	1 ...	0.5
Hymenolepis nana	2 ...	— ...	0.2
Taenia	1 ...	— ...	0.1
E. coli	164 ...	— ...	19.3
E. histolytica	33 ...	— ...	3.5
Giardia intestinalis	2 ...	— ...	0.2
Negative examinations	287 ...	12 ...	35.2

(B) Europeans. Total number of specimens examined 279.

Parasite	Males	Females	Percentage Infested
E. histolytica	43 ...	18 ...	21.8
Giardia intestinalis	4 ...	— ...	1.4
Chilomastix mesnili	1 ...	— ...	0.3
Trichomonas hominis	2 ...	— ...	0.6
Taenia	1 ...	— ...	0.3
Enterobius vermicularis ...	1 ...	— ...	0.3
Ascaris lumbricoides	7 ...	— ...	2.5
Strongyloides	4 ...	— ...	1.4
Negative examinations ...	— ...	— ...	71.4

Consideration of Findings in Detail.

(A) *Trematoda.* *Schistosomiasis.*

1.4 per cent. of the specimens from Africans contained ova of *S. mansoni*, (Sambon, 1907). The figure is low but coincides wich clinical experiences that rectal schistosomiasis is not particularly common in this district.

Ova of *S. haematobium* (Bilharz, 1852), were found in 0.2 per cent. of samples; these were probably due to the contamination of the faeces by voided urine though Khalil, (1926), recorded the presence of such ova in the faeces of 65 patients out of 7,156 inspections.

Cestoda. *(1) Taenia.*

Taenia eggs were demonstrated in two stools, one from a European and one from an African. After treatment the worms were expelled and examined and in each case the offender proved to be *T. saginata*, (Goeze, 1782).

(2) Hymenolepis nana, (Siebold, 1852.)

Two African males were found to harbour this parasite, but no infestations were observed in Europeans.

(C) Nematoda *(1) Hookworm.*

Hookworm ova were discovered in 52.2 per cent. of the faecal specimens from Africans. Adult worms were recovered from six cases, and on inspection found to possess the characteristics of *Necator americanus*, (Stiles, 1902).

(2) Strongloides stercoralis. (Bavay, 1856).

2.1 per cent. the stools from Africans, and 1.4 per cent. of those from European contained this parasite.

(3) Ascaris lumbricoides, (Linn, 1758).

Ova of this parasite were found in 3.4 per cent. of the African specimens, and 2.5 per cent. of the European samples.

(4) *Trichuris trichiura*, (Linn, 1771).

An incidence of infestation of 0.6 per cent was found in the series of African stools.

(5) *Enterobius, vermicularis*, (Linn., 1758).

Ova were discovered in 0.5 per cent. of the specimens from Africans and 0.3 per cent. of those from Europeans.

(D) Protozoa. *(1) Entamoeba coli*, (Grassi, 1879).

19.3 per cent. of the stools from Africans contained this protozoon but it was not observed in any of the samples from Europeans.

(2) Entamoeba histolytica, (Schaudinn, 1903).

The incidence of parasitisation by this organism was as follows:—

Africans 3.5 per cent. Europeans 21.8 per cent. Cysts were found in the faeces of 8.2 per cent. of the Europeans and 9 per cent. of the Africans who harboured this parasite.

This protozoon has been the source of a great amount of indisposition among the Europeans, particularly has this been the case during the last two years.

The monthly incidence of sickness due to the parasite, proves that fresh cases arise chiefly during the rainy season, when flies are abundant and when the possibility of contamination of food is at the maximum.

Monthly Incidence of E. *histolytica* infection in Europeans and Africans.

January	14	cases
February	11	,,
March	2	,,
April	4	,,
May	1	,,
June	5	,,
July	2	,,
August	Nil	,,
September	2	,,
October	9	,,
November	22	,,
December	30	

(3) *Giardia intestinalis*, (Lambl, 1859).

The incidence of this parasite in the fæces of Europeans and Africans, was 1.4% and 0.2% respectively.

(4) *Chilomastix mesnili*, (Wenyon, 1910).

This was not observed in any of the African specimens, but was contained in 0.3% of those from Europeans.

(5) *Trichomonas hominis*, (Davaine, 1860).

This parasite was found in 0.6% of the specimens from Europeans.

Conclusions. The aforementioned figures cannot be regarded as an absolutely accurate index of intestinal parasitisation in this district, nevertheless the results can be considered as an indication of the relative incidence of the various helminths and protozoa inhabiting the alimentary tract of both Europeans and Africans resident in Zomba.

The high incidence of *Entamoeba histolytica* infestation in Europeans is of considerable interest, but it is not difficult to imagine the major part played by the African houseboys in the dissemination of this infection.

Concerning hookworm disease, most of the positive stools revealed evidence of only a slight infestation, an appearance compatible with the clinical findings, which are usually quite mild. I am of the opinion that this parasite is not such a source of serious disability as is generally supposed.

Schistosomiasis is a much more serious complaint than hookworm disease, it is more difficult to treat, and the actual tissue damage produced by the parasite can only be repaired with difficulty, further the early lesions often undergo malignant change. Fortunately however, the predominant symptoms such as bloody urine, bloody stools, painful micturition and tenesmus are more than even an African can regard with apathy, and thus he endeavours to obtain early treatment and thereby facilitates the arrest of the disease.

The prevention of helminthic and protozoal intestinal infestation is a subject of great interest, but cannot be dealt with in this article.

H. M. Shelley,
Pathologist.

Colonial Development Fund.

Dr. Shircore who was then the Director of Medical and Sanitary Services of Tanganyika Territory visited this Protectorate in 1930 upon instructions issued by the Secretary of State for the Colonies in order to report upon the condition of the Medical and Health services and to make recommendations for expansion and improvement in relation to a special grant which was being made from the Colonial Development Fund.

The grant originally approved for Medical and Health services from this Fund was £101,410, but for various reasons the amount finally approved was reduced to £78,284.

Medical activities in the year preceding 1929 had to some extent stagnated and little or no expansion had taken place in the Medical Department; Dr. Shircore in his report mentions that the total number of beds provided in the Government Hospitals was 170 and the total number of in-patients treated 3,821.

At the end of 1933, appoximately 600 beds were available and the number of in-patients treated had increased to 7,322. According to returns the native population has increased during the same period from 1,135,945 to 1,609,817. Twelve new hospitals have been constucted by means of the Colonial Development Fund at the following places:—

Zomba	...	Chikwawa	...	Kasungu
Cholo	...	Lilongwe	...	Mzimba
Mlanje	...	Fort Manning	...	Kota Kota
Chiradzulu	...	Dowa	...	Karonga

While additional ward accommodation has been provided at

Fort Johnston,
Port Herald and
Dedza.

Child welfare clinics with accommodation for 12 maternity cases have been erected at

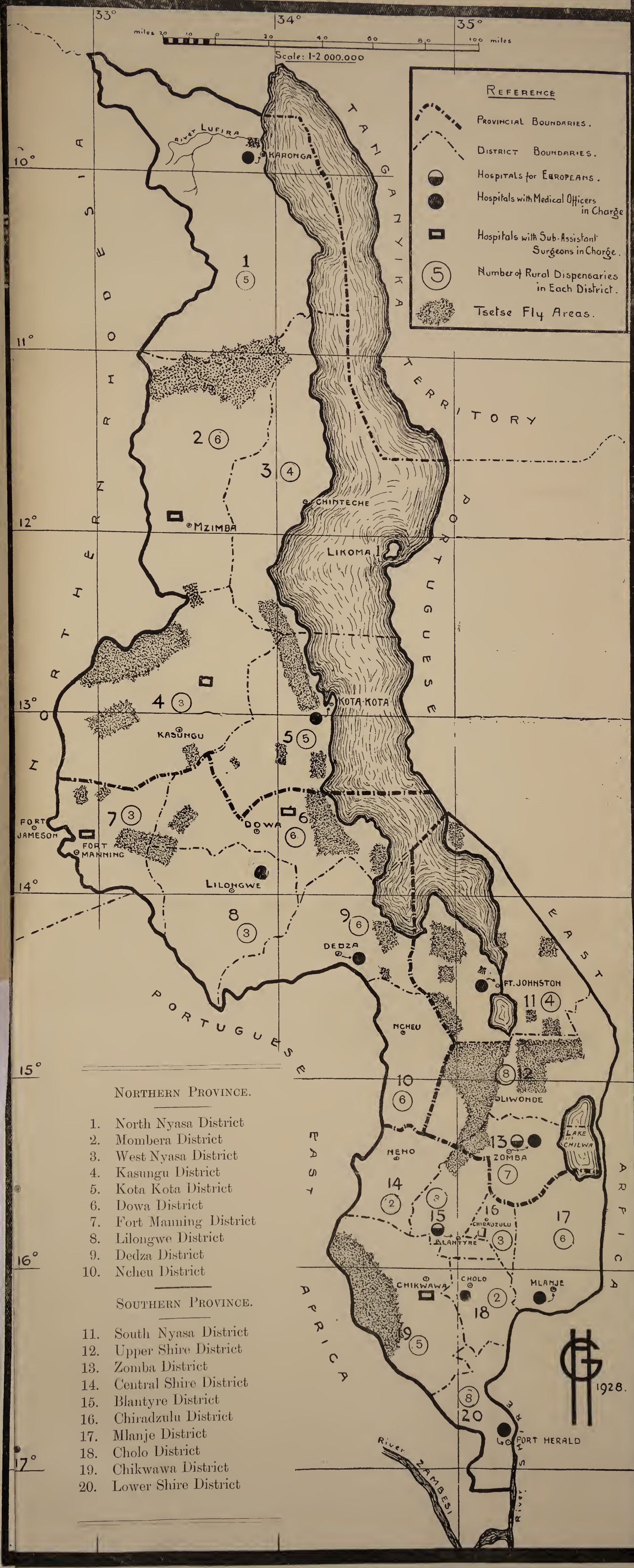
Fort Johnston and
Port Herald.

And a further clinic is in course of erection at Kota Kota. 36 rural dispensaries have been completed and over £1,100 has been expended in the improvement of village water supplies; a grant of £500 has provided assistance in the erection of a welfare clinic at the Blantyre Mission; an X-ray plant is being purchased for the Medical Department and various sanitary works have been completed in the Townships of Limbe and Blantyre.

The subject of the sanitation of Zomba formed a separate paragraph of Dr. Shircore's report and it was recommended that both the night soil and rubbish should be removed by motor lorry. Afterwards it was decided that a water system should be laid on and that the night soil should be disposed of by water carriage, and funds to the extent of £9,633 were provided from Colonial Development. The installation has not yet been completed, water is laid on but the sewage scheme is still in embryo—and no steps have as yet been taken with regard to the disposal of rubbish.

As far as the sanitation of Blantyre and Limbe is concerned, Dr. Shircore's recommendations have been given effect to and have resulted in considerable improvement in the old insanitary conditions.

NYASALAND PROTECTORATE



Northern Province.

1. North Nyasa District
2. Mombera District
3. West Nyasa District
4. Kasungu District
5. Kota Kota District
6. Dowa District
7. Fort Manning District
8. Lilongwe District
9. Dedza District
10. Ncheu District

Southern Province.

11. South Nyasa District
12. Upper Shire District
13. Zomba District
14. Central Shire District
15. Blantyre District
16. Chiradzulu District
17. Mlanje District
18. Cholo District
19. Chikwawa District
20. Lower Shire District

1928.